

Depression among pregnant women testing for HIV in rural South Africa

by
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*Dissertation presented for the degree of Doctor of Philosophy at the
University of Stellenbosch*



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March 2011

Declaration

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Abstract

Pregnancy is a vulnerable time in settings such as sub-Saharan Africa, and is associated with exposure to a multitude of physiological, social and psychological risks. High HIV prevalence, and the fact that many women will test for HIV for the first time during their pregnancy, has raised concern about women's psychological health during pregnancy. Depression during the antenatal period is of public health concern as it has been shown to be associated with poorer foetal and delivery outcomes, risky behaviours, and poorer uptake of antenatal care. Antenatal depression is a predictor of postnatal depression, and postnatal depression has been associated with poor maternal sensitivity and attachment in mothers which is known to result in increased behavioural and developmental difficulties in children.

The aim of this research was to provide a clear, in depth and culturally sensitive understanding of the manifestation of depression in pregnant women in a rural area with high HIV prevalence in South Africa. The research method included a diagnostic assessment of depression in 109 women in their third trimester of pregnancy, and an in-depth qualitative examination of the contextual framework within which HIV testing and depression are experienced with a sub-sample of 56 women.

The quantitative results demonstrated that the prevalence of antenatal depression was high (46.7%), with close to half of the women being diagnosed with depression. Presentations of depression most frequently included disturbances in mood, loss of interest and suicide ideation. Symptoms which overlap with common side effects of pregnancy such as loss of energy and weight change did not result in an overestimation of depression. Likewise, very little evidence of the somatisation of depression, or particular cultural barriers to the diagnosis of depression based on DSM-IV criteria was found. Rates of suicide ideation were high and equally common among HIV positive as HIV negative women.

Factors significantly associated with depression included living within a family homestead, access to a regular source of income and practical support from a partner. Both income and partner support had a negative association with depression. Living away from a family or parental home had a positive association with depression.

The results showed that the Edinburgh Postnatal Depression Scale (EPDS) was effective in identifying depression and that a shorter three item version was as effective as longer versions. A positive score for depressed mood on the EPDS was significantly associated with HIV, suggesting that the EPDS is a good screening tool for elevated psychological risks among HIV positive women post HIV testing.

Qualitative results showed that having an unsupportive partner and the occurrence of relationship or familial conflict played an important role in the development of emotional distress during pregnancy and resulted in a high number of unwanted pregnancies. Partner and familial conflict was intertwined with cultural practices which govern the acceptability of childbearing among unmarried women and the social recognition of partnerships and paternal responsibilities. Testing for HIV was considered a stressful life event for all women regardless of their HIV status and was a particularly negative life event for women who tested HIV positive or for women who had concerns over partner infidelity. Disclosure among HIV positive women frequently lead to increased partnership conflict. Qualitative findings suggested that depression and emotional distress after HIV testing did interfere with women's ability to engage with prevention messages. Women who were coping well with learning their HIV positive status had high levels of family disclosure and subsequent family support in common.

The implication of this research is that it is important that public health programmes screen for depression among childbearing women. These data suggests that a shorter three item version of the EPDS along with screening for partner and family support or conflict would effectively detect most women at high risk for depression. Likewise, public health interventions for women with depression which are implemented in primary health care facilities and in isolation of the partnership and familial context within which depression occurs are not likely to be effective. Further research is needed to establish the precise prevalence of antenatal and postnatal depression in women at high risk for HIV; to validate the effectiveness of a shorter screening tool in resource limited settings; and to establish risk and protective factors, and trimester specific risks which could inform the design of cost effective interventions in poorly resourced settings.

Opsomming

Swangerskap in Afrika, suid van die Sahara, is 'n kwesbare tydperk met blootstelling aan 'n menigte fisiologiese, sosiale en sielkundige risiko's. Die hoë voorkoms van HIV en die feit dat baie vrouens gedurende swangerskap vir die eerste keer vir HIV wil toets, het 'n besorgdheid oor vrouens se sielkundige gesondheid gedurende swangerskap laat ontstaan.

Depressie gedurende die voorgeboortelike periode is van belang vir publieke gesondheid, want daar is bewyse wat dui op 'n verband tussen depressie en swakker fetale en geboorte resultate, riskante gedrag en verminderde gebruik van voorgeboortelike sorg. Voorgeboortelike depressie is 'n indikasie van moontlike nageboortelike depressie en nageboortelike depressie word geassosieer met swak moederlike sensitiwiteit en die gebrekkige vorming van 'n band tussen moeder en kind; wat reeds bewys is om te lei tot verhoogde gedrags- en ontwikkelingsprobleme in kinders.

Die doel van hierdie navorsing was om 'n duidelike, indiepte en kulturele-sensitiewe begrip van die manifestasie van depressie in swanger vroue in 'n landelike omgewing met hoë HIV voorkoms in Suid Afrika te verkry. Die navorsingsmetode sluit in 'n simptomatiese beraming van depressie by 109 vroue in hul derde trimester van swangerskap en 'n indiepte kwalitatiewe ondersoek na die kontekstuele raamwerk waarbinne HIV toetse en depressie ondervind word met 'n sub-steekproef van 56 vrouens.

Die bevinding was dat die voorkoms van voorgeboortelike depressie hoog was, 46.7 %, met feitlik die helfte van die vrouens wat met depressie gediagnoseer is. In die meeste gevalle het die voorkoms van depressie gepaard gegaan met 'n verandering in gemoedstoestand, 'n verlies aan belangstelling en selfmoordgedagtes. Simptome wat ooreenstem met algemene nuwe-effekte van swangerskap, soos verlies aan energie en verandering in gewig, het nie bygedra tot 'n oorberekening van depressie nie. Soortgelyk is baie min bewyse gevind dat somatisasie van depressie, of spesifieke kulturele grense, tot die diagnose van depressie gebaseer op DSM-IV-kriteria bydra. Die oorweging van selfmoord was hoog en algemeen tussen beide HIV-positiewe en HIV-negatiewe vrouens. Faktore wat aansienlik met depressie geassosieer word, sluit in om in

’n familiegroep te bly, toegang tot ’n vaste bron van inkomste en die praktiese ondersteuning van ’n lewensmaat. Beide inkomste en die ondersteuning van ’n lewensmaat het ’n negatiewe verbintenis met depressive. Om nie by familie of in ’n ouerhuis te bly nie het ’n positiewe assosiasie met depressive. Alhoewel HIV-status verband hou met depressie, was dit nie uitermate die geval nie, alhoewel daar ’n gebrek aan statistiese kragdoeltreffendheid was om die effek van HIV vas te stel, gegee die beperkte grootte van die steekproef.

Die resultate het getoon dat die EPDS graderingsinstrument effektief was om depressie te identifiseer en dat ’n korter driepunt weergawe daarvan net so effektief was soos die langer weergawe. ’n Positiewe telling vir ’n depressiewe gemoedstoestand op die EPDS het ’n betekenisvolle assosiasie met HIV en dui daarop dat die EPDS ’n goeie graderingsinstrument is vir verhoogde sielkundige risiko by HIV-positiewe vrouens, selfs al is HIV-positiewe vrouens in dié steekproef statistieksgewys nie meer geneig tot depressie as HIV-negatiewe vrouens nie.

Kwalitatiewe resultate toon dat ’n lewensmaat wat nie ondersteunend is nie en die voorkoms van verhoudings- of familiekonflik ’n belangrike rol speel in die ontwikkeling van emosionele angste gedurende swangerskap en dit het gelei tot ’n groot aantal ongewenste swangerskappe. Konflik met ’n lewensmaat en met familie was verweef met kulturele gebruike wat die aanvaarbaarheid van geboortes onder ongetroude vrouens beheer en die sosiale erkenning van verhoudings en die vader se verantwoordelikhede. ’n HIV-toets is as ’n stresvolle lewensgebeurtenis beskou deur alle vroue, ongeag van hulle HIV-status en was ’n besondere negatiewe lewensgebeurtenis vir vroue wat HIV-positief getoets het of vir vroue wat bekommerd was oor hulle lewensmaats se getrouheid. Onthulling van die HIV-status van positiewe vrouens het gelei tot verhoogde konflik in verhoudings. Kwalitatiewe bevindings dui daarop dat depressie en emosionele angste na ’n HIV-toets ineen met ’n vrou se vermoë om ag te slaan op voorkomingsboodskappe. Vroue wat die kennis van hulle HIV-positiewe status goed hanteer het, het hoër vlakke van bekendmaking van hulle status en die ondersteuning van hulle familie in gemeen.

Die implikasie van die navorsing is dat dit belangrik is vir publieke gesondheidsorgprogramme om te toets vir depressie onder swanger vroue. Die resultate dui daarop dat ’n korter driepunt weergawe van die EPDS, saam met ’n ondersoek na die

ondersteuning van of konflik met 'n lewensmaat en familie, effektief kan wees om vroue met 'n hoë risiko vir depressie te identifiseer. Soortgelyk, publieke gesondheidsingryping in primêre gesondheidsorg fasiliteite vir vroue met depressie wat in isolasie van die lewensmaat en familie konteks, waar depressie voorkom geadministreer word, is onwaarskynlik om te slaag.

Bevindings onderskryf die belangrikheid van ondersteuning vir die familie om effektief te kan reageer en herstel van stresvolle faktore soos onbeplande swangerskappe en HIV-diagnose, in 'n konteks wat swaar deur HIV geaffekteer word, aangesien dit 'n voorkomende effek op depressie kan hê.

Verdere navorsing is nodig om die presiese voorkoms van voorgeboortelike en nageboortelike depressie in vrouens met 'n hoë blootstelling aan HIV vas te stel; om die sukses van 'n korter graderingsinstrument in arm omgewings te staaf; en om die risiko en beskermende faktore vas te stel en trimester spesifieke risiko's wat die ontwerp van 'n koste-effektiewe ingryping in gebiede met ontoereikende hulpbronne kan beïnvloed.

Acknowledgements

I would like to thank all the women who participated in this study, gave of their time and shared their feelings openly.

A special thanks to my supervisor, Professor Mark Tomlinson, for his confidence in me, for sharing of ideas, thoughtfulness and support when needed, and for attentive supervision throughout the finalisation of this dissertation.

I would like to both thank and acknowledge Professor Alan Stein and the Child and Adolescent Psychiatry Unit at Oxford University for providing the funding to support this research and for the kind and conscientious supervision provided throughout the development, implementation and analysis of this work. Thanks to the project staff: Nompilo Buthelezi and Phumzile Mkwanazi.

I thank Professor Marie-Louise Newell for creating the time and space for me to analyse and to write up the results of this study and for her interest, mentorship and moral support, I am immensely grateful for this time to learn and grow as a researcher.

Thanks to Dr Ruth Bland for protecting time and offering ongoing support.

Thanks to all the Africa Centre staff that assisted with moral support, encouragement and technical questions in particular: James, Portia, Till, Frank, and Graeme for their inputs into the data analysis and interpretation of results, and to Makandwe, John and Thembelihle for assistance with sourcing literature. Thanks to Sonja, Suzette and Rhana for administrative support and to Angela and Carol for enthusiastic proofreading.

To the special circle of friends who have supported patiently and cheered me on continually: Roy, Angela, Carol, Leisl, Derval, Bianca, Alastair, Saadna and Karen and to my family for love and care through the best and worst bits: Mum, Gill, Catherine, Belinda, Toby, Steven and Peter.

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Chapter 1

Introduction

1.1 Maternal depression – a psychological health concern

Pregnancy and motherhood are often portrayed as happy and fulfilling experiences for women and their families. In reality, experiences of pregnancy and motherhood are highly contextualised and can be strongly influenced by situations of adversity. High rates of unplanned pregnancies, challenging social circumstances, low social support, poverty or illness can all significantly influence a women's psychological health during pregnancy and the early postnatal period. There is increasing recognition of the risk of depression during pregnancy and the postnatal period and the health implications this may have for mothers, their young infants and their families.

Depression during pregnancy is of public health concern because it is associated with poorer foetal and delivery outcomes, risky behaviours, and poor uptake of antenatal care (Wachs, Black, & Engle, 2009). Further, antenatal depression has been shown to be a strong predictor of postnatal depression, and postnatal depression has been associated with poor uptake of health services and lowered health promoting behaviours (Stewart, Robertson, Dennis, Grace, & Wallington, 2003). The identification of antenatal depression is particularly important since treatment for antenatal depression has been shown to be efficient and cost effective, and because the adverse effects of untreated antenatal depression are far reaching, extending into infancy, childhood and adolescence (Center on the Developing Child at Harvard University, 2009).

1.2 Maternal depression – risk in low and middle income countries

Increasingly, low and middle income countries are being found to have a high burden of maternal depression (World Health Organisation, 2009). Not only is the prevalence of maternal depression higher in low and middle income countries than is frequently evidenced in high income countries, but its impact extends beyond psycho-social developmental delays to poorer maternal and child health outcomes (World Health Organisation, 2008). In low and middle income settings maternal depression is a common source of disability with significant economic and human costs (Patel, Chisholm, Kirkwood, & Mabey, 2007).

The burden of depression in low and middle income countries most likely relates to women's exposure to multiple depression related risk factors not least of which include poverty, conflict, violence, displacement, migration and the increasing threat of HIV and AIDS (Broadhead & Abas, 1998). There is robust evidence that along with other physiological and poverty related risk factors, and the threat of HIV, maternal depression introduces significant risk of maternal morbidity and threatens young children's healthy development in low and middle income country contexts (Stein et al., 2005; Walker et al., 2007).

1.3 Maternal depression – risk in South Africa

In South Africa, like in many low and middle income countries, pregnancies are often stressful life events. Women are required to make considerable adjustments, frequently with few resources, and are often exposed to a multitude of risks factors such as negative life events and poor social support (Robertson, Grace, Wallington, & Stewart, 2004). High antenatal HIV prevalence and Prevention of Mother to Child Transmission (PMTCT) programmes also result in women testing and learning their HIV status for the first time during pregnancy. Testing positive for HIV is considered a negative life event, more especially so during pregnancy (Lester, Partridge, Chesney, & Cooke, 1995) and receiving an HIV positive result has been shown to be associated with depression among non pregnant women in South Africa (Olley, Seedat, Nei, & Stein, 2004). These cumulative exposures to risk raise serious concerns about women's psychological health during pregnancy in South Africa.

While there is little evidence on antenatal depression in South Africa, studies which have examined postnatal depression have found high rates of between 34% and 48% (Cooper et al., 1999; Lawrie, Hofmeyr, de Jager, & Berk, 1998; Madu & Roos, 2006; Spangenberg & Pieters, 1991).

A baseline study in the geographical area where this research was undertaken showed high rates of depression during pregnancy using the Edinburgh Postnatal Depression Scale (EPDS) screening measure. Screening positive for risk of antenatal depression on the EPDS was associated with unplanned pregnancies but not with HIV, however women had not learnt their HIV status at the time of the assessment. Depression was also significantly associated with perceptions and expectations of being discriminated against in health care services (Rochat et al., 2006).

Further research is needed to develop an understanding of the prevalence and risks for antenatal depression, in particular among pregnant women testing for HIV in South Africa.

1.4 Maternal depression – methodological challenges for research

Beyond the paucity of research evidence on maternal depression (and particularly antenatal depression) in South Africa, concerns have been raised in the maternal depression literature that cultural variables may influence the reporting of depression in culturally diverse settings (Bebbington, 1993; Stern & Kruckman, 1983) but research to support this is far from equivocal (Patel, 2001; Posmontier & Horowitz, 2004).

Proponents of these concerns argue that the use of standardised assessment methods and diagnostic systems in culturally diverse contexts may be culturally insensitive and increase the risk of over or under reporting depression in these contexts (Halbreich et al., 2007). However, opponents such as Patel (2001) argue that careful development of culturally appropriate terminology for depression can bridge the gap between lay and biomedical models and improve detection and treatment.

In developing methodology for the rigorous study of depression in a complex cultural setting such as South Africa, the recommendations made by Prince (2008) for cross cultural investigations into depression are helpful. He recommends three strategies to ensure that research on depression is culturally sensitive, including: a process of careful translation of the measures; pretesting and piloting of measurement tools; and qualitative research to investigate the cultural relevance of depression and the contextual factors within which it exists.

1.5 The problem statement

Antenatal depression introduces significant risks for mothers and their infants: It is known that antenatal depression can introduce threats to maternal and child health during pregnancy and the postnatal period (Alder, Fink, Bitzer, Hosli, & Holzgreve, 2007; Lancaster et al., 2010) in particular in low and middle income settings where the threat of maternal morbidity and mortality is already unacceptably high.

Many known risk factors for antenatal depression are commonplace in South Africa: Common risk factors for antenatal depression include a previous history of depression, low socioeconomic status, negative or stressful life events, unplanned or unwanted pregnancies, relationship difficulties and a lack of social support (Lancaster, et al., 2010). Many of these risk factors are commonplace in low and middle income countries such as South Africa (Brandt, 2009).

High HIV prevalence introduces a particular set of new risks during pregnancy: Testing for HIV or learning your HIV positive status during pregnancy is considered a negative and stressful life event, placing women at increased risk for developing antenatal depression (Lester, et al., 1995; Sandelowski & Barroso, 2003). Likewise, several factors associated with depression are also known to be risk factors for HIV, and research with non-pregnant samples has shown that HIV and depression are associated (Cook et al., 2006). As a result, antenatal depression may be elevated among women in areas highly affected by HIV.

Existing evidence suggests that the prevalence of antenatal depression in South Africa may be high: It is known that the presence of antenatal depression is the strongest predictor of postnatal depression (Robertson, et al., 2004). Existing research has shown that in several areas of South Africa postnatal depression is higher than would be expected in Africa, and at least three times higher than the international expected prevalence (Halbreich & Karkun, 2006). Preliminary research suggests that rates of antenatal depression may be even higher (Rochat, et al., 2006).

Current evidence suggests that antenatal depression may impact on prevention and treatment for HIV: Since antenatal depression is known to influence engagement with health care

and health risk behaviours, it is likely that the presence of antenatal depression may hinder adequate uptake of HIV prevention and treatment interventions (Kopelman et al., 2008), heightening the need for public health interventions to address antenatal depression in the context of HIV prevention and treatment.

In South Africa, antenatal depression and the factors associated with it require further research: In order for public health intervention efforts for the detection, prevention and treatment of both HIV and maternal depression to be successful, it is important to develop a better understanding of the number of women affected, the factors associated with, and the presentation of antenatal depression among these high risk groups of women.

Access to effective treatment for depression requires effective screening, diagnosis and treatment models: Treatment of both antenatal and postnatal depression has been shown to be effective in low and middle income countries (Rahman, Malik, Sikander, Roberts, & Creed, 2008) and in African contexts (Bolton et al., 2003), and has been shown to lower health care services costs internationally (Simon, Khandker, Ichikawa, & Operskalski, 2006). While treatment may be known to be effective, access to treatment is not likely without adequate detection, and most depression goes undetected as a result of poor screening practice and resource constraints (Luskin, Pundiak, & Habib, 2007). While effective screening does not automatically amount to effective treatment access or improved outcomes (Miller, Shade, & Vasireddy, 2009) it is an important first step in addressing antenatal depression in South Africa.

Cultural factors may limit the use of DSM-IV diagnostic approaches in South Africa: It is possible, given evidence from some African cultures, that the presentation of depression in African cultures may be distinct from DSM-IV classifications of depression, and that this may hinder the assessment of depression and the interpretation of results (Halbreich & Karkun, 2006). However, rigour in translation, piloting and qualitative work is suggested to improve the cultural sensitivity and relevance of assessments of depression in these contexts (Prince, 2008).

1.6 The purpose of this research

While available evidence on postnatal depression in South Africa is increasing, there is little or no evidence regarding the risks, prevalence or presentation of depression during pregnancy. The purpose of this research is to address these gaps in evidence on antenatal depression in South Africa.

1.6.1 Research aim

The aim of this study was to provide an in depth and culturally sensitive understanding of the manifestation of depression in pregnant women in a rural area with high HIV prevalence in South Africa. The research design aimed to provide both a gold standard diagnostic assessment of depression and an in-depth qualitative examination of HIV positive and HIV negative women's social and cultural experiences of pregnancy. The study also aimed to establish common factors associated with antenatal depression and to determine whether a short screening tool (EPDS) could be used to accurately detect antenatal depression in this context.

1.6.2 Research questions

This study examined five questions aimed at addressing gaps in current literature in South Africa.

- 1) What is the prevalence of antenatal depression in areas with high HIV prevalence in South Africa?
- 2) What depressive symptoms are common to antenatal depression in Zulu populations, and to what extent do cultural factors mediate the understanding or reporting of depressive symptoms in this context?
- 3) What common factors, including HIV, are associated with antenatal depression in this context?
- 4) Is the EPDS an effective screening tool for antenatal depression in these contexts?
- 5) What are women's experiences of pregnancy, HIV and the social and cultural context within which they experience and report depression?

Chapter 2

Review of literature

2.1 Introduction

The subject of this dissertation overlaps with a number of disciplinary areas including public health, psychology, psychiatry and social epidemiology. The approach to the review of literature attempts to give consideration to the interfaces between these disciplinary areas, while also focusing on each area individually (Bambra, 2009). Established guidelines were used in conducting a review of the literature (Jackson & Waters, 2005; Peacock & Forbes, 2004; Popay, Rogers, & Williams, 1998).

Literature searches included the following databases: Medline, Pub med, EBSCO, Science Direct, Psych Info, Scopus, Google Scholar, The Directory of Open Access Journals (DOAJ) and the Cochrane library. Further, an internal Endnote database of over 4000 abstracts hosted by the Section of Child and Adolescent Psychiatry, Oxford University was searched.

Given that literature on both “maternal depression” and “HIV” as independent subject areas is vast and highly variable in quality, specific search criteria were applied during literature searches. Searches focused on studies which were empirical, peer reviewed and published in English between 1990 and 2010 and included searches for systematic reviews and meta-analyses in each subject area.

While research conducted as part of a dissertation (masters or PhD) was considered during the review process, it was only included in the literature review if it was found to have subsequently been published in a peer reviewed journal.

Initial literature searches focused on two broad areas:

- Maternal depression: Including key words: ‘depression’ AND/OR ‘antenatal’ ‘postnatal’ ‘perinatal’ ‘depression’ ‘psychiatric epidemiology’ ‘prevalence’ ‘screening’ ‘diagnosis’ ‘risk factors’ ‘treatment’.
- HIV/AIDS: Including key words: ‘diagnosis’ ‘PMTCT’ ‘mental health/illness’ ‘depression’ ‘psychiatric’. Furthermore all HIV searches included a *limiting key word specifier* of AND/OR ‘antenatal’ ‘postnatal’ ‘perinatal’ ‘pregnancy’ ‘maternal HIV’ ‘mothers’ in either article title, abstract or key words.

In reviewing and assessing the quality of articles and abstracts on depression authors needed to explicitly state the nature of the sample (clinical or community) to include the diagnostic criteria for depression, the temporal period for diagnosis, and the method of assessment (self report or clinical interview). In reviewing articles and abstracts on HIV similar criteria were applied and authors needed to include pregnancy or the postnatal period as the focus of study. The postnatal period was loosely defined to include up to one year following the birth of the child. These initial limits produced a surplus of unspecific medical literature and very little psychiatric, psychological or social literature in the field of HIV. As such a further search was undertaken examining the psychological and social aspects of HIV:

- Psychology of HIV/AIDS: including key words: HIV/AIDS AND/OR ‘psychosocial’ ‘consequences’ ‘suicide’ ‘counselling’ ‘support’ ‘parenting’ ‘motherhood’ ‘caregiving’ ‘prevention’ ‘personal experience’ ‘psychosocial adjustment’.

The results of these initial searches were reviewed and the reference lists of these publications examined to identify further publications relevant to the thesis subject area. At this stage of the review process seminal articles which were frequently cited in the literature (1990-2010) but were published prior to 1990 were also searched and reviewed. Following this initial review process, a revised set of key words were developed and secondary searches of data bases were conducted which focused on:

- Low and middle income settings: ‘maternal depression’ ‘antenatal depression’ ‘postnatal/postpartum depression’ ‘common mental illness/disorder’ AND/OR ‘low and middle income settings’ ‘developing countries’.

- Qualitative Research: ‘qualitative methodology’ ‘research’ AND/OR ‘HIV’ ‘depression’ ‘HIV and depression’ ‘mental health’ ‘chronic illness’ ‘PMTCT’ ‘HIV counselling and testing’ ‘living with HIV’ ‘paternal HIV’ ‘qualitative’ ‘mixed method’ ‘health service research’.
- Cross cultural factors: ‘culture’ AND/OR ‘depression’ ‘etic/emic’ ‘cross-cultural psychiatry’ ‘culture and depression’ ‘psychiatric epidemiology’ ‘social/community epidemiology’ ‘somatisation’ ‘African’ ‘mental illness’ ‘mental health’ ‘stigma’ ‘bewitchment’ ‘HIV’.

While significant literature on maternal depression and some literature on maternal depression and HIV were found for East and West Africa, most literature in Southern Africa was limited to adult or postnatal depression. Little evidence relating to antenatal depression in Southern Africa was found. Specific secondary searches of the following data bases were undertaken to ensure inclusion of Southern African and South African literature: NiPAD, SA-e-publications and Sabinet using the same key words as the initial search.

A search was also conducted on the Database of African Thesis and Dissertations, and several masters dissertations were found in South Africa which met key word search criteria for ‘maternal/perinatal depression’. However, on examination of this grey literature no publications were found to be linked to these unpublished dissertations. The dissertations found focused on specific target groups (for example ‘women with post partum psychosis’ or ‘adolescent pregnancies’) and/or used methodology limited to case studies and qualitative samples with <20 participants.

For purposes of quality of evidence the final review only includes peer-reviewed publications. The literature reviewed in this chapter is organised into three parts.

The review of literature is organised into three parts.

Part 1: Classification, definitions and the theoretical framework

Firstly, the classification of depression is outlined along with a guide to definitions and terminology used in this study. This is followed by a description of the theoretical framework. This study adopts a bio-psycho-social approach as its theoretical perspective and the vulnerability-stress model is described to frame the discussion of risk and resilience factors in the development of a depressive disorder.

Part 2: Maternal depression in the global context

In the second part of this chapter, using the vulnerability-stress model as a theoretical framework, the review of the literature begins with an overview of the prevalence and risks for maternal depression and its impact on maternal and child health in the global context. The current evidence on vulnerability to depression at different time periods in women's lives is reported and evidence on the bio-psycho-social stressors shown to increase risk of depression in the antenatal period are summarised. Evidence of the impact of socioeconomic status, poverty and HIV on maternal mental health in low, middle and high income countries is presented. This section ends with a summary and a description of the gaps identified in the current literature on maternal depression.

Part 3: Maternal depression in the Southern African context

Thirdly, the chapter reviews existing research in Southern Africa and South Africa on antenatal and postnatal depression. This part of the review includes an examination of studies on the prevalence of maternal depression in Southern Africa and known risk factors for maternal depression. The risks or vulnerabilities introduced by HIV, poverty and social issues in the Southern African context are outlined and special issues related to the psychological sequelae of HIV counselling and testing and the Prevention of Mother to Child Transmission (PMTCT) are explored. Literature on the relationship between HIV and adult depression, treatment and adherence is also briefly reviewed.

2.2 Part 1: Classification, definitions and the theoretical framework

In this section of the chapter the diagnostic approach of the Diagnostic & Statistical Manual of Mental Disorders (DSM) classification system, now in its fourth edition, is outlined. Limitations in the classification of depression during the antenatal and postnatal period in the DSM-IV are identified and the terminology used for this study is described. This is followed by an examination of the theoretical framework for this research.

2.2.1 Classification of depression in the antenatal and postnatal period

The main classification system used for the diagnosis of depression is the diagnostic and statistical manual, fourth edition (DSM-IV) published by the American Psychiatric Association (American Psychiatric Association, 1994) with a text revision (TR) in 2000 (American Psychiatric Association, 2000). DSM classifications are developed and periodically reviewed based on generalisable empirical evidence up to that time. There was no robust evidence to suggest that the presentation of major depressive disorder during the antenatal or the postnatal period differs significantly from affective disorders that occur in women at other times (Cox, Murray, & Chapman, 1993; Kumar, Marks, Platz, & Yoshida, 1995). As a result, neither antenatal nor postnatal depression is classified as a distinct type of depression in the DSM-IV-TR. Instead, episodes of major depression during the antenatal and postnatal period are classified as affective disorders. In the classification system, important terms are used to specify a diagnosis of major depression, including the terms ‘onset’ and ‘duration’. Onset relates to the time at which the depressive episode comes about, and is often used to distinguish groups of individuals with major depression disorder. Duration refers to the length of time that the individual has depressive symptoms warranting a diagnosis of depression, duration can be classified as acute (≤ 2 months) and chronic (≥ 2 months).

Significantly more research has become available over the last decade on the risk of depression in the early postnatal period as compared to non-pregnant women. Even though depressive disorders in the antenatal or postnatal period are not classified as types of depression in the current classification system, they are widely referred to, reported on and researched, and identified by their onset being either during pregnancy or the postnatal period. As a result of significant research evidence on depression with early postnatal onset prior to 2000, the specifier

‘with postpartum onset’ was introduced to DSM-IV-TR (2000). While the specifier in the DSM-IV-TR classification is limited to the first four weeks after childbirth, research since this last text revision has tended to examine a longer period, up to and including the first year after birth.

The criteria used for the diagnosis of antenatal depression in this study were the same as the diagnostic criteria used for a major depressive disorder in the DSM-IV-TR (2000) outlined in Figure 2-1. For the purpose of this study, antenatal depression refers to a major depressive episode, with onset in the antenatal period, and with duration of at least 2 weeks or more.

Criteria for Major Depressive Episode

Five (or more) of the following symptoms have been present during the same 2-week period and represent a change from previous functioning; at least one of the symptoms is either:

1. Depressed mood or
2. Loss of interest or pleasure.

Note: Do not include symptoms that are clearly due to a general medical condition, or mood-incongruent delusions or hallucinations.

Criteria A

1. Depressed mood most of the day, nearly every day, as indicated by either subjective report (e.g. feels sad or empty) or observation made by others (e.g. appears tearful)
2. Markedly diminished interest or pleasure in all, or almost all, activities most of the day, nearly every day (as indicated by either subjective account or observation made by others)

Criteria B

3. Significant weight loss when not dieting or weight gain (e.g. a change of more than 5% of body weight in a month), or decrease or increase in appetite nearly every day
4. Insomnia or hypersomnia nearly every day
5. Psychomotor agitation or retardation nearly every day (observable by others, not merely subjective feelings of restlessness or being slowed down)
6. Fatigue or loss of energy nearly every day
7. Feelings of worthlessness or excessive or inappropriate guilt (which may be delusional) nearly every day (not merely self-reproach or guilt about being sick)
8. Diminished ability to think or concentrate, or indecisiveness, nearly every day (either by subjective account or as observed by others)
9. Recurrent thoughts of death (not just fear of dying), recurrent suicidal ideation without a specific plan, or a suicide attempt or a specific plan for committing suicide

Differential diagnosis

- The symptoms do not meet criteria for a Mixed Episode
- The symptoms are not due to the direct physiological effects of a substance (e.g. a drug of abuse, a medication) or a general medical condition (e.g. hypothyroidism)
- The symptoms are not better accounted for by Bereavement, i.e. after the loss of a loved one, the symptoms persist for longer than 2 months or are characterized by marked functional impairment, morbid preoccupation with worthlessness, suicidal ideation, psychotic symptoms or psychomotor retardation.

The symptoms cause clinically significant distress or impairment in social, occupational, or other important areas of functioning

Postnatal onset specifier: Onset of episode within 4 weeks postnatal

Figure 2-1 DSM-IV-TR (2000) Criteria for Major Depressive Disorder

The time period used to delineate antenatal and postnatal depression differs substantially across research studies and a range of terminology is used, including antenatal, prenatal, perinatal, postpartum and postnatal.

Terms that will be used to describe depression are defined below:

- Antenatal depression: is defined as a major depressive episode which has its onset during pregnancy, this excludes a pre-existing depression which continued following the ‘event’ of a pregnancy.
- Postnatal depression: is defined as a major depressive episode which has its onset from birth up to 12 months after childbirth, while this may include the continuation of a major depressive episode which had its onset during the pregnancy it does not include depression with onset prior to the pregnancy which continued throughout the pregnancy and into the postnatal period.
- Maternal depression: is used to refer to both antenatal and postnatal depression.
- Previous history of depression: refers to a history of a major depressive episode or disorder, which occurred prior to the pregnancy and which resolved prior to the onset of the pregnancy.
- Major depressive episode: refers to clinical depression which requires the meeting of diagnostic criteria in Figure 2-1
- Minor depression: refers to women who fail to meet the number, severity and duration requirements of symptoms to be classified as major depression, but who do present with depressive symptoms.

2.2.2 Theoretical approaches to understanding depression during pregnancy

Pregnancy and birth are personal, social and biological events. Every woman’s experience of pregnancy is unique and takes place within the context of different emotional, psychosocial and physical circumstances. However, as with all universal events, a number of experiences are common to most pregnancies. For between 10 and 20% of women the world over the experience of pregnancy will also include depression, either during pregnancy, or in the early postnatal period.

There are several theoretical approaches which can be applied to, and which inform our understanding of the development of depression during pregnancy and the postnatal period. Most approaches fall into one of three categories: biological, psychological or social perspectives.

Biological approaches focus on the physiological process of pregnancy and childbearing and the hormonal changes associated with it which are theorised to result in or be linked to the development of depression. These approaches centre on evidence related to the role of changes in oestrogen, progesterone and cortisol during pregnancy, the perinatal and postnatal periods. The role of a prior personal or family history of depression, the implications of ceasing antidepressant therapies among women seeking to become pregnant, the impact of perinatal depression on infant physiology and development and the increased vulnerability during subsequent pregnancies are often the focus of these biomedical approaches to depression and childbearing. Interventions for antenatal, perinatal or postnatal depression within these theoretical frameworks tend to focus on pharmacological interventions with research centred particularly on the safety and obstetric implications of pharmacological therapies during pregnancy and breastfeeding.

Psychological approaches to depression during childbearing focus on individual and intra-psychic perspectives, and take the view that pregnancy and childbirth is a developmental process and that adjustment to pregnancy involves several developmental tasks influenced by variables such as past experience (particularly one's own experience of being mothered, prior learning, competencies and self worth, or important past life experiences such as abandonment, sexual abuse or trauma) and how the adjustment to pregnancy is influenced by aspects of personality (for example, examination of the role of traits such as neuroticism). A lack of mastery or adjustment to the developmental task of pregnancy results in feelings of inadequacy, worthlessness and ultimately depression. Therapeutic responses may include individual or group psychotherapy interventions or cognitive behaviour approaches. Research focuses on the examination of psychological risk factors and the efficiency of various interventions approaches (individual versus group, psychotherapy versus cognitive behavioural), all of which may show varying efficiency depending on the hypothesised causal factors and treatment context.

Social approaches to the understanding of the development of depression during pregnancy focuses on the contextual, environmental and interpersonal factors related to the

pregnancy, taking the view that pregnancy is a socially constructed experience, and a time when women's roles and identity become subject to redefinition and reorganization and their relationships undergo rapid change. Psychosocial stressors such as marital difficulties, partnership or interpersonal conflicts or a lack of support within the broader social support network are seen to play an important role in the development of depression. Similarly environmental or chronic stressors such as unemployment or lower socioeconomic status resulting in the pregnancy being experienced as significantly more stressful and may lead to the development of depression. Research and interventions for depression focus on the provision of practical support, on increasing autonomy and on improving the quality of personal, marital or familial relationships. Group interpersonal therapy (ITP) has shown particular efficiency given its focus on social roles.

Historically, biological or medical approaches have dominated the research and management of childbearing related depression. But research on the role of hormonal fluctuations during pregnancy is not without critique, for example feminist and social constructionist theories call for more realist and critical approaches to women's experiences of depression. Feminist theorists, such as Jane Ussher, in particular suggest that biological approaches serve to medicalize women's experience in order to legitimise expert intervention while negating aspects of social, interpersonal experience (Ussher, 2010).

Further, there is growing evidence that patient perceptions of health and threat of disease, as well as barriers in a patient's social or cultural environment, appear to influence the likelihood that a patient will engage in health-promoting and treatment behaviours, such as medical adherence and seeking health care. Harris (2001), in seminal work on the understanding of depression, argues that increasingly both naturalist studies and controlled trials are pointing to particular psychosocial situations (ones which result in experiences of powerlessness and hopelessness) being circumstantial pathways to depression; while experiences of emotional meaning and new hope are pathways to remission.

Hence, while there are a number of perspectives and approaches by which one could view and respond to depression during pregnancy, there is also growing consensus that the etiological pathway to depression is likely complex and mediated and moderated by biological, psychological and social variables (Harris, 2001). While the etiology of antenatal depression is

not fully understood, and no single causal factor has been identified, it is likely that a confluence of genetic susceptibility, hormonal changes, psycho-social stressors, past life experience and cognitive and attributional styles lead to the common pathway of depression.

2.2.3 Vulnerability-stress models of depression

In contrast to theoretical models of depression which focus on either biological, psychological or social influences in isolation of one another, the biopsychosocial approaches suggest that it is important to consider all three influences together to further our understanding of depression and to improve models of treatment.

Building on these combined biopsychosocial approaches and perspectives, the vulnerability-stress model (Monroe & Simons, 1991) is a psychological model which explains depression as both a result of biological or genetic vulnerabilities and life experiences or stressors. Vulnerability-stress models take a developmental perspective to psychopathology (Abela & Hankin, 2008). From this perspective a predisposition or innate vulnerability interacts with the environment and life experiences (or stressors) which trigger psychological disorders, such as depression. In the vulnerability-stress model the greater the underlying vulnerability, the less stress is needed to trigger depression. Conversely, where there is a smaller genetic or biological contribution greater life stress is required to produce depression (Gibb & Abela, 2008).

The vulnerability-stress model of depression has not only improved our understanding of depression but has also influenced the development of interventions for depression (Ingram & Price, 2001). Vulnerability-stress approaches aim to manage depression by:

- (i) Reducing biochemical vulnerability through the use of psychopharmacological medication, therefore allowing the individual greater resilience to life stressors (Kopelowicz & Liberman, 2003; Kopelowicz, Liberman, & Wallace, 2003); and
- (ii) Reducing negative cognitions and interpersonal conflict that arise in response to stressful life events or frame the interpretation of stressful events (Gotlib & Hammen, 1992; Ingram, Miranda, & Segal, 1998).

Cognitive behavioural or interpersonal therapy interventions are therefore employed as a means to adjust negative cognitions, perceived social roles and the associated quality of interpersonal interactions in the presence of a stressor or stressors, and in doing so reduce the overall risk or impact of depression despite biological vulnerabilities (Ingram & Price, 2001). Research has demonstrated that combined approaches which include psychopharmacology to address biological vulnerabilities and therapeutic interventions to address cognitive, psychological and interpersonal stressors, and to build protective attributes are more effective than either approach alone; although psychological interventions alone have a slightly greater efficiency than do pharmacological interventions alone (Cook, et al., 2006).

Kopelowicz et al. (2003) in rehabilitative work with severe psychiatric morbidity, have adapted the vulnerability-stress models to include a third component called protective factors. They propose that particular protective factors (which may be the result of personal attributes which are supported or skills which are learnt through intervention) are able to reduce both biological vulnerability (for example, through improved compliance to psychopharmacological interventions) and/or reduce the impact of stressors or risk factors (for example, through improved self efficiency, coping skills, social support or adapted appraisal of the stressor). These protective factors can mediate future risk of onset or relapse and should be incorporated into psychological and social interventions. Protective factors which can improve resilience may include positive self esteem, coping skills or medical adherence.

These more inclusive vulnerability-stress-resilience models add to previous vulnerability-stress models by providing for both a continuum of vulnerability and a continuum of disorder severity (Ingram & Luxton, 2005) as illustrated in Figure 2-2. Resilience or protective factors can reduce vulnerability or can mediate the effects of stressors and decrease severity.

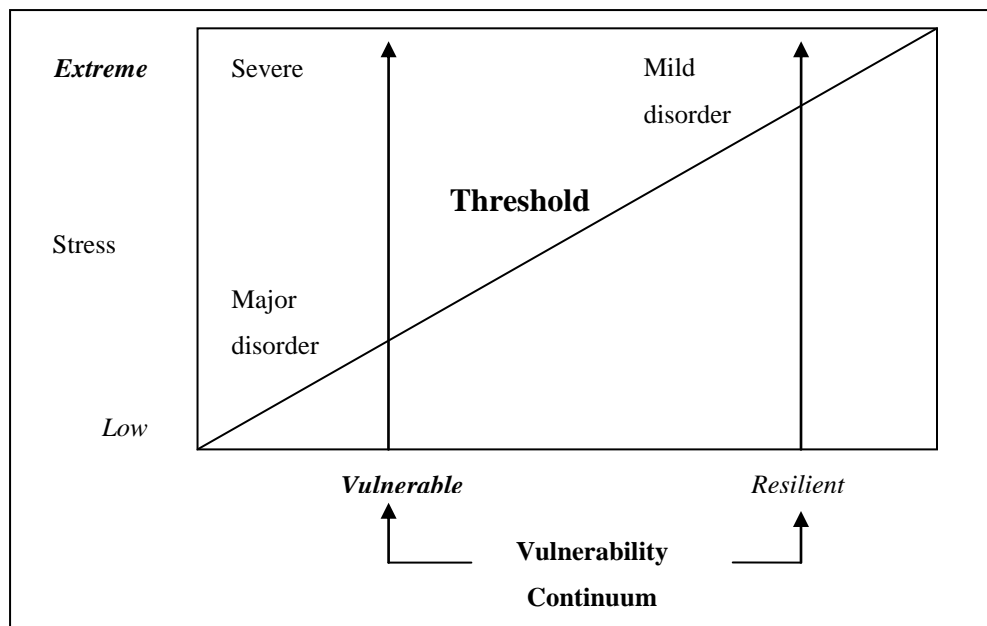


Figure 2-2 The Vulnerability-Resilience Model (Ingram & Luxton, 2005, pp 41)

An understanding of the nature of psychological, social or environmental risks and the protective factors that may mediate biological vulnerabilities during pregnancy is necessary in order to ensure effective and appropriate public health responses for antenatal depression. This vulnerability-stress-resilience model is used as a theoretical framework for this research, and the review of literature will focus on what is known regarding vulnerability to depression during pregnancy and the risks or stressors which are known to interact with those vulnerabilities both globally and in Southern Africa. Given that Africa and Southern Africa are also culturally distinct and diverse and since cultural variables are known to interact with depression (in some instances as a stressor leading to increased risk and in some instances as a protective factor which reduces risk) the literature on the role of culture and maternal depression will also be examined as part of this review.

2.2.4 Summary of classifications, terminology and the theoretical framework

- The DSM-IV-TR (2000) classification of depression is adopted for use in this study. This classification system currently only provides for a specifier 'with post partum onset' given limited evidence to demonstrate that antenatal or postnatal depression is a particularly (aside from time of onset) different disorder from major depression.

- Research on depression during childbearing periods (pregnancy and the postnatal) uses a wide range of terminology. This research will use antenatal and postnatal consistently to refer depression during pregnancy and the postnatal period and maternal depression to refer to studies on both antenatal and postnatal depression.
- Antenatal and postnatal depression in this study relate to depression which has its onset during pregnancy or the postnatal period, and specifically exclude depressive disorders which preceded the pregnancy, and were not resolved at the time of the pregnancy.
- Theoretical approaches to depression during pregnancy include theories which focus on biological, psychological or social perspectives exclusively. More recent evidence suggests that considering the role of biological, psychological and social perspectives together has improved our understanding of depression.
- Biopsychosocial approaches attempt to consider the complexity of variables which may influence the onset and recovery from maternal depression. This research will take the vulnerability-stress-resilience model of depression as its theoretical framework.
- The vulnerability-stress-resilience model allows for consideration of all three influences as well as constructs of resilience and protective factors in understanding the severity of, and recovery from depression.

2.3 Part 2: Maternal depression in the global context

This section of the review presents a summary of the literature on the prevalence, risks and impact of maternal depression in the global context.

2.3.1 Vulnerability during the antenatal and postnatal period

Adult depression represents a major worldwide health problem and is the fourth biggest cause of disability internationally (World Health Organisation, 2010). Globally, women of childbearing age have been shown to be particularly vulnerable to depression (Kessler et al., 2003). In South Africa, research on the epidemiology of depression has shown that women are almost twice as likely to be depressed as compared to their male counterparts, and when they are depressed they are at least twice as likely to have a chronic major depression lasting over a year (Tomlinson, Grimsrud, Stein, Williams, & Myer, 2009).

Research has examined whether women are at greater risk during the antenatal and postnatal period as compared to other times during their childbearing years. To date, no evidence has been found to suggest that women in the antenatal period are significantly more vulnerable to depression than their non-pregnant counterparts (Vesga-Lopez et al., 2008). However, women in the early postnatal period have consistently been shown to be at significantly greater risk for onset of depression as compared to non-pregnant women (O'Hara & Swain, 1996; Vesga-Lopez, et al., 2008).

While pregnancy does not hold specific elevated risk for depression there is growing evidence that a previous history of depression significantly elevates risk for depression during pregnancy (Luskin, et al., 2007), suggesting that pregnancy represents increased vulnerability among women already predisposed to depression. It is unclear how much of this risk is accounted for by predisposition alone or by the biological changes or psycho-social stressors associated with pregnancy and their interactions with existing vulnerabilities, or how much may relate to the cessation of pharmacological treatment in order to facilitate pregnancy (Cohen et al., 2006).

The evidence on elevated risk in the postnatal period appears to suggest that there are distinct vulnerabilities and stressors within the first few weeks post birth since all women, even

those with no previous history of depression, are at increased risk (Vesga-Lopez, et al., 2008). Of growing interest is evidence to suggest that postnatal depression may develop along a continuum with emergent risk factors during pregnancy. Research from a large community based sample of 14,000 women in the United Kingdom found that most postnatal depression was preceded by antenatal depression or anxiety (Heron, O'Connor, Evans, Golding, & Glover, 2004). Likewise, in a large prospective cohort of 12,361 women in Australia, Milgrom et al. (2008) showed that antenatal symptoms were as common as postnatal symptoms and that depression during pregnancy or a previous history of depression were significant predictors of postnatal depression. Lau, Wong and Chan (2010) found that among 2,178 women in China, depression symptoms in the second and third trimester have a strong predictive relationship to postnatal depression at 6 weeks postnatal. Rahman and Creed (2007) have shown a similar pattern of symptom development from the antenatal to the postnatal period in research in a rural part of Pakistan. Similarly, a recent international meta-analysis of over 14 000 participants by Robertson et al. (2004) found antenatal depression as the strongest predictor of postnatal depression.

Importantly, while there may not be elevated prevalence in the antenatal period, evidence from longitudinal research has showed that when symptoms of depression are present in the antenatal period, there may a higher number of symptoms reported than in the postnatal period (Evans, Heron, Francomb, Oke, & Golding, 2001). As a result of this emerging literature, antenatal depression is a growing public health concern. This is not because it is particularly prevalent, or more prevalent than major depression among non-pregnant women or postnatal women, but because when it is present it tends to be severe and is linked to the development of postnatal depression. Likewise, evidence suggests that antenatal depression is often poorly detected and has significantly lowered treatment rates as compared to non-pregnant samples, even in well resourced contexts (Vesga-Lopez, et al., 2008).

2.3.2 The prevalence of antenatal and postnatal depression

O'Hara and Swain (1996) undertook one of the first meta-analyses of postnatal depression including 59 studies and 12,810 women. The overall prevalence of postnatal depression was 13% (95% CI 12.3-13.4%). This meta-analysis did not find any difference in prevalence by country and showed that studies using self report measures yielded significantly

higher estimates than studies using interview based methods. As O'Hara and Swain illustrate, one of the limitations in the literature of maternal depression is the heterogeneity of both method and results making comparison complex and problematic.

A vast number of maternal-specific depression instruments have been utilised to measure the prevalence of depression during pregnancy and the postnatal period. Studies either utilise standardised interviews which are considered the gold standard or they make use of self-report rating scales. By far the most widely used instrument in maternal depression studies and for population-based screening is the Edinburgh Postnatal Depression Scale (EPDS), a 10-item self-report scale specifically designed to screen for postnatal depression in community samples and validated for use during pregnancy (Dennis, 2003).

However, several other screening tools are also utilised, most commonly the Becks Depression Inventory (BDI) and to a lesser extent also the Centre for Epidemiological Studies-Depression Scale (CES-D), the Hospital Anxiety and Depression Scale (HADS), the Profile of Mood States (POMS) and the Zung Self-Rating Depression Scale (ZSRDS). As Dennis (2003) illustrates, several researchers have conducted comparisons between these diverse self-report measures to determine which instrument is the most effective in identifying mothers with depression and the EPDS has demonstrated significant superiority against other measures.

In their meta-analysis, O'Hara and Swain suggest that the variance in performance of structured interviews as compared to rating scales likely relates to the method by which rating scales capture and count numbers of signs or symptoms without adequately capturing the duration and severity requirements of a clinical diagnosis as is possible in structured interviews. Further they point out that while the difference between self report and interview methods was significant, it was also small, representing only one percentage point difference in overall prevalence. Instead, they show that the principal methodological factor influencing prevalence estimates in their meta-analysis was the time period under evaluation. Studies which used a wider time period reported higher prevalence and studies using narrower time windows often had higher precision. This meta-analysis did not examine the prevalence of antenatal depression.

A more recent systematic review (Bennett, Einarson, Taddio, Koren, & Einarson, 2004) focused exclusively on the prevalence of antenatal depression. The aim of this review was to

establish a general prevalence estimate for pregnancy and as a result the authors excluded studies which focused exclusively on high risk groups such as adolescents and women with HIV or other pregnancy complications. Likewise, given that socio-economic status is known to be so closely correlated with depression, studies which only examined women of low socio-economic status were included, but examined separately. The review included 21 studies from 13 countries with most participants being from the United States and England, most being urban and of diverse socioeconomic status. Research from low and middle income countries was not included in this review.

Meta-analysis techniques used by Bennett and colleagues (2004) weighted results by sample size and adjusted for between study variance in order to reduce the impact of between study differences on overall prevalence estimates. Separate analysis examined the effect that method of evaluation (self report versus interview) and lowered socio-economic status group may have on overall prevalence. The systematic review provided weighted average estimates across studies with 95% confidence intervals and offered comparisons of prevalence by both trimester and measurement method.

Based on a total sample of 19,284 pregnant women the prevalence of depression by trimester was 7.4% (2.2-12.6) in the first trimester, 12.8% (10.7-14.8) in the second trimester and 12.0% (7.4-16.7) in the third. The rates of depression in the meta-analysis measured by the EPDS and the structured interview were similar while those measured on the Beck Depression Inventory (BDI) were significantly higher. An examination of the influence of cut off scores did not suggest that lower cut offs resulted in the increased observed prevalence. The authors conclude that it is likely that the high number of somatic items (common to pregnancy) on the BDI as compared to the EPDS could have resulted in the BDI overestimating depression.

The separate meta-analysis of low socio-economic status groups showed that these women have much higher meta-analytic rates of depression in both the second and third trimester. While rates differ by assessment method, the increase is still substantial on both self report and interview methods. These authors found that among lower socio-economic groups in the second trimester prevalence rates of 47% were found when studies used self report and 28% when clinical interviews are used. In the third trimester studies using self report found prevalence 39% by self report and 25% by clinical interview. In both instances the difference in

prevalence on clinical interview and rating scales is significant (between 14 and 19%) which may indicate that among lower socio-economic groups reporting of numbers of signs and symptoms may be particularly higher and that measures which do not capture severity or duration may over estimate depression significantly. More generally, prevalence was still high regardless of method, suggesting that women from low socio-economic groups, regardless of whether they live in high income countries, are at significantly higher risk of depression during pregnancy. Most studies in the review also found high numbers of women who do not meet the criteria for clinical depression on a structured interview but who do present with significant symptomology or minor depression, suggesting that minor depression is also frequently reported among lower socio-economic groups.

On balance, Bennett and colleagues (2004) suggest that it is likely that the rates presented in their review are conservative, in particular given that depression is likely to cause women to decline to participate or to drop out of studies. This review found that estimates of antenatal depression are similar to estimates of postnatal depression, but that estimates are much higher than in the non-pregnant population, in particular during the second and third trimester.

While the meta-analysis reported high levels of heterogeneity in results within each trimester Bennett et al. (2004) did not uncover any systematic differences (having examined factors such as age, socio-economic status, parity, marital status) and no particular publication bias was noted. Further, an examination of method of evaluation of depression did not explain the heterogeneity. Given the limited number of studies on antenatal depression, meta-regression to establish the source heterogeneity was not possible. These authors raise a concern that poor classification of depression is a substantial limitation in research on antenatal depression to date. Since classification issues are not carefully addressed, it is possible that some of the depression attributed to the antenatal period may have existed before the pregnancy. There may also be an inherent detection bias given that being pregnant and seeking medical care may have resulted in the first diagnosis of a pre-existing depression. Likewise, some heterogeneity may be caused by the differences in the underlying risk of participants across studies given that some studies did not report previous psychiatric history, some included participants with previous histories of depression, while others excluded participants with previous histories of depression.

Gavin et al. (2005) undertook a systematic review of depression during the antenatal and postnatal period. This meta-analysis included 28 studies on major and minor depression during the antenatal period and the first twelve months postnatal, and compared point and period prevalence and incidence to that of non-pregnant or postnatal women. The subsequent analysis excluded six studies based on selection bias relating to ethnicity or socio-economic status or as result of methodological criteria. As a result the final analysis in this review was based on a smaller number of studies with only half the original sample size and was limited to high income countries.

The postnatal prevalence findings were similar to that of O'Hara and Swain (1996) in the postnatal period. Period prevalence showed that 18.4% of women were depressed during their pregnancies, 12.7% of which were women suffering from major depression. Few studies in the review examined incidence, but among those who did incidence of major depression during pregnancy was 7.5% and a combined incidence of 14.5% was found when both minor and major depression were considered. Gavin et al. (2005) found no significant difference in prevalence or incidence among pregnant women as compared non-pregnant samples. Population characteristics, in particular socioeconomic status was found to influence prevalence, with prevalence estimates of major depression being similar across socio-economic groups, but minor depression being more prevalent among lower socioeconomic status groups.

This review has several limitations, confidence intervals are wide and precision low and the results should be interpreted with caution. Estimates are based on a very small number of studies and tests of homogeneity showed that there was significant heterogeneity between studies. Significant numbers of studies/participants were excluded from the analysis: all developing country research was excluded, and women from high risk populations such as low income groups were excluded, thus limiting the applicability of the findings.

As illustrated thus far, most reports of high prevalence in higher income countries have included large numbers of inner-city, low socio-economic status women (Zlotnick, Johnson, Miller, Pearlstein, & Howard, 2001). Research suggests that a strong relationship exists between socio-economic status and maternal depression. It is reasonable to assume that women living in low to middle income countries are likely to be exposed to a much harsher socio-economic

environment with higher numbers of economic stressors during and after pregnancy. These harsh socio-economic environments also commonly feature lower levels of social supports, and, as a consequence, little buffering against the effect of socio-economic stressors when they come about. Increasing evidence is emerging to show that the relationship between depression and socio-economic status evidenced among low income groups in high income countries may also be generalisable to low and middle income countries where socio-economic stressors are much more pervasive and social support networks poor (World Health Organisation, 2008).

Research from low and middle income countries has found that the prevalence of maternal depression is high. In the early part of the last decade Rahman, Iqbal and Harrington, (2003) found a point prevalence of 25% in the antenatal period and 28% in the postnatal period among rural women in Pakistan, while Patel, Rodrigues and De Souza (2002) found rates of 23% among postnatal women in India, and Wolf, DeAndraca and Lozoff, (2002) found rates between 35 to 50% in Latin America. More recent research has confirmed these early high estimates. For example, estimates between 28 and 57% have been observed in Pakistan (Ahmad & Khan, 2005; Kazi et al., 2006) confirming Rahman et al.'s (2003) earlier findings. Wachs et al. (2009), in a review on maternal depression in low and middle income countries, reported that in the last five years most studies from many low and middle income countries in Africa, Asia and South America have shown high prevalence, indicating a global threat to maternal and child health, developmental potential and the human rights of children.

Sawyer, Ayers and Smith (2010) undertook a systematic review of pre and postnatal psychological well being in Africa. This review included both the antenatal and postnatal depression and examined a wider range of disorders including anxiety and post traumatic stress disorder (PTSD). The review included 35 studies with 10,880 participants and reported prevalence rates of maternal psychological health in eight different African countries. The meta-analytic technique calculated the prevalence of each disorder as an aggregate mean, weighted by the number of subjects in contributing studies. A large proportion of the studies included in the review were from one country (Nigeria) and as a result these studies were subject to sub-analyses.

Only 13/35 studies from five countries (n=1217) examined psychological disorders during pregnancy (Nigeria n=8; Uganda n=2; and Morocco, The Gambia and Zimbabwe n=1

each) pointing to the paucity of research on psychological disorders during pregnancy on the African continent and in sub-Saharan Africa in particular. The prevalence of antenatal depression ranged from 4.3% to 17.4% with the weighted mean prevalence of 11.3% (95% CI 9.5%–13.1%) during pregnancy; and 18.3% (95% CI 17.6%–19.1%) in the postnatal period. Only one study in this review examined both depression and anxiety over a course of pregnancy. Esimai et al., (2008), in a study in Nigeria, found that while anxiety is more prevalent in the early stages of pregnancy and depression is more prevalent in the later stages of pregnancy, little is known about the co-morbidity of depression and anxiety.

Other important findings by Sawyer and colleagues (2010) include that the majority of studies in Africa used structured interviews (n=20); the balance used either self report measures (n=10) or both (n=3). Screening measures for depression included the EPDS and BDI, and an examination of prevalence by measurement tool showed that the pattern of higher prevalence on self report measures as compared to structured interviews, as seen in systematic reviews of high income countries, was also common in Africa. This review also found that women experience similar rates of antenatal and postnatal depression in African countries as they do in high income countries, suggesting that maternal depression may not be a culture-bound phenomenon as suggested by Stern and Kruckman (1983). Furthermore, this review illustrates that there is a lack of research on antenatal depression in Africa.

2.3.3 The impact of antenatal depression

The research which has examined antenatal depression has shown that antenatal depression has a negative impact on the mother and her fetus. Antenatal depression has been associated with poor health behaviours and increased risk taking behaviours in pregnant women (Zuckerman, Amaro, Bauchner, & Cabral, 1989). Studies which have examined antenatal depression and its association with other pregnancy complications have found that depressed mood is associated with more obstetric complications, more physical symptoms during pregnancy like headaches and nausea, more obstetric visits and admissions to hospital, more disability days during pregnancy, and more pain relief during labour than non-depressed women (Alder, et al., 2007). Likewise, women with depression have greater fear of childbirth and more negative childbirth experiences (Alder, et al., 2007; Andersson et al., 2003). Much of the

research on the impact of antenatal depression has focused on particular directional effects, for example the impact of depression on obstetric outcomes, when it is also likely that an adverse obstetric factor may in turn trigger depression. Studies which examine how pregnancy events may influence risk of depression are examined in more detail in the section on risks in this review.

Increasingly research is beginning to highlight the risk antenatal depression may hold for foetal development and pregnancy outcomes. There is growing consensus that psychopathologies such as depression and anxiety are associated with neuroendocrine alterations which may affect the fetus over maternal-placental-foetal pathways (Alder, et al., 2007). Depressed women produce higher levels of stress chemicals during pregnancy, which reduce foetal growth and are associated with an increased risk for premature labour (Diego et al., 2009), lowered birth weight and gestational age (Andersson, Sundstrom-Poromaa, Wulff, Astrom, & Bixo, 2004; Hoffman & Hatch, 2000; Orr, James, & Blackmore Prince, 2002), in particular among black women (Field et al., 2009), as well as increased admissions to neonatal care units (Chung, Lau, Yip, Chiu, & Lee, 2001; Misri et al., 2004). Research has also shown an impact on neonatal outcomes, with depressive symptoms in an expectant mother associated with altered immune functioning in her baby after birth (Mattes et al., 2009). Strikingly, recent research has found that antenatal depression is linked to the silencing of a gene that controls the over-production of stress chemicals (Oberlander et al., 2008).

Evidence on the link between depression and preeclampsia is less clear, with one study finding an association (Kurki, Hiilesmaa, Raitasalo, Mattila, & Ylikorkala, 2000) while another did not (Sikkema et al., 2001). Further research is needed to address methodological limitations in the current research and to replicate important findings (for example, studies on preeclampsia have used diverse outcomes, small samples sizes and have failed to control adequately for confounding variables. However, on the balance, in research to date, the majority of existing studies have found that depression has a negative influence on obstetric, foetal and neonatal outcomes (Alder, et al., 2007). Research from low and middle income countries has shown that a high prevalence of depressed mood during pregnancy is associated with inadequate antenatal care, low birth weight and preterm delivery, and increased risks of poor maternal and child health outcomes (Patel, Rahman, Jacob, & Hughes, 2004).

Depression during pregnancy is also known to be one of the most significant factors to predispose women to risk of postnatal depression following the birth of the baby (Lee & Chung, 2007; Robertson, et al., 2004). Depression in the postnatal period, in turn, has been shown to have significant detrimental effects, not only for the mother, but also to the health and development of her young infant (Stein, Lehtonen, Harvey, Nicol-Harper, & Craske, 2009). Postnatal depression in low and middle income countries is not only significantly higher but is distinct in that the impact of maternal depression on infants goes beyond delayed psycho-social development (as seen in high income countries) and also includes low birth weight, reduced breast-feeding, hampered growth, severe malnutrition, increased episodes of diarrhoea and lower compliance with immunization schedules (World Health Organisation, 2008). Some affects may be direct while others may be more indirect, for example, depression could impact on obstetric factors as with prolonged labour (of more than 24 hours) or a delayed initiation or difficulties with breastfeeding which may in turn be indicative of more diarrhoeal episodes (Hanlon et al., 2008).

Intervention approaches during the antenatal period are restricted by the fact that pregnancy prevents the widespread use of psychopharmacological interventions given their effect on foetal development, birth weight and risk of preterm delivery (Suri et al., 2007). Likewise, the discontinuation of psychopharmacological interventions in order to facilitate pregnancy may to some extent increase vulnerabilities, or pregnancy itself may increase the reoccurrence of major depression (Cohen, et al., 2006).

2.3.4 Vulnerabilities and stressors associated with antenatal depression

Globally, research studies, systematic reviews and meta-analyses have examined the risk factors for maternal depression (Beck, 2001; O'Hara & Swain, 1996; Robertson, et al., 2004) but less is known about the specific risk factors for antenatal depression in particular, since most studies examining antenatal depression have limited their focus to its role as a predictor of postnatal depression (Alder, et al., 2007; Bunevicius et al., 2009).

The limited evidence that is available on antenatal depression suggests that risk profiles are similar to those evidenced in postnatal depression (Lee & Chung, 2007; Lusskin, et al., 2007). Three broadly defined categories of risk: biological, social and psychological are known

to be associated with both antenatal and postnatal depression in the research to date. More recently, attention has shifted to the nature of trimester specific risks during pregnancy. Evidence on risk factors informs our understanding of how vulnerability and stress interact during pregnancy to increase vulnerability to antenatal or postnatal depression. Each of these categories of risk will be briefly reviewed.

2.3.4.1 Biological risk factors

While studies on direct biological factors such as estrogens, progesterone, oxytocin and prolactin hormones and thyroid function, amongst others, have found some evidence of their association with the development of depression, no conclusive evidence exists on a single biological pathway to the development of maternal depression (Robertson, Celasun, & Stewart, 2003). Research is complicated by the fact that evidence suggests a complex set of endocrine interactions, and in that the effect of biological changes on the development of depression appears intertwined with prior vulnerability to depression. While depression and anxiety symptoms during pregnancy do contribute independently of other biomedical risks to adverse obstetric, foetal and neonatal outcomes, no clear interventions guidelines exist (Alder, et al., 2007).

A personal history of depression has been consistently correlated with both antenatal and postnatal depression and represents an innate vulnerability to depression (Lancaster, et al., 2010; O'Hara & Swain, 1996), which is heightened in women in their childbearing years (Kessler, et al., 2003). The rapid biological and hormonal fluctuation of pregnancy is believed to introduce increased vulnerability in particular among women with a pre-existing vulnerability to mood disorders. The effect size associated with past history of depression as a risk factor makes it one of the stronger predictors of depression during the antenatal and postnatal period. A history of antenatal depression is also a significant risk factor for postnatal depression (Robertson, et al., 2004).

Family history of depression, while not necessarily only a biological risk factor, has been shown in non-pregnant samples to increase the risk of depression for any individual; however, with antenatal and postnatal depression, family history has been implicated less consistently (Luskin, et al., 2007). O'Hara and Swain (1996) combined data from six studies including close

to 900 women and found no association between family history and maternal depression, while Johnstone, Boyce, Hickey, Morris-Yatees & Harris (2001) did find increased risk in a smaller study of 490 women with family history of depression. Some difficulties in evidence may relate to reporting issues as reporting family history requires that the subject be aware of family history, which is not frequently the case (Robertson, et al., 2003).

While not a direct biological factor, obstetric factors, including pregnancy or delivery related complications, genetic disorders and chronic or pregnancy related illnesses have a small but significant effect on the development of antenatal and postnatal depression (Alder, et al., 2007; O'Hara & Swain, 1996; Robertson, et al., 2004). A meta-analysis of research in Africa did not find any significant association between obstetric variables and depression (Sawyer, Ayers, & Smith, 2010), however, individual studies have found associations between parity (Alami, Kadri, & Berrada, 2006), hospitalisation during pregnancy (Adewuya, Ola, Aloba, Dada, & Fasoto, 2007; Esimai, Fatoye, Quiah, Vidal, & Momoh, 2008) and depression in African settings. Interactional and confounding effects (such as whether the reason for hospitalisation is the trigger variable for depression rather than the hospitalisation itself) have been poorly examined in many studies.

Research on the association of chronic illness such as diabetes, hypertension or HIV and depression suggests that there is increased risk of mood disorders during pregnancy and the postnatal period among these populations, however to date these illness have received less attention in the literature (Alder, et al., 2007; Lusskin, et al., 2007). Kapetanovic et al. (2009) showed that risk of maternal depression among HIV positive women is associated with prior psychiatric history, substance abuse, lowered CD count and antiretroviral treatment adherence problems.

Some association has been found between antenatal depression and unplanned pregnancies (Beck, 2001; Lancaster, et al., 2010). Robertson and colleagues (2003) caution that research on unplanned pregnancies should be viewed with caution since most studies do not measure women's feelings towards the growing fetus but merely the circumstances in which the pregnancy occurred, suggesting that unplanned and unwanted pregnancies need to more clearly delineated in research. Bunevicius et al., (2009) examined risk for antenatal depression across the three trimesters of pregnancy and included a measurement of whether pregnancy was

planned or unplanned and wanted or unwanted. Results showed that unplanned and unwanted pregnancies were independently and significantly associated with antenatal depression across all three trimesters, while other risk factors such as education and history of depression were trimester-specific. Research in Nigeria (during pregnancy) and South Africa (during the postnatal period) have found associations between unplanned or unwanted pregnancies and depression (Adewuya, et al., 2007; Cooper, et al., 1999).

2.3.4.2 Psychological risk factors

Becoming a mother is a major life transition that requires adjustment. Maternal personality characteristics including neuroticism and negative cognitive attributional style have been identified as small to moderate risk factors for depression in pregnancy and the postnatal period (O'Hara & Swain, 1996). These psychological risk factors may include or influence ambivalence about the pregnancy, in particular with an unplanned pregnancy.

Co-morbid psychiatric illness has shown some association with antenatal depression. Heron et al. (2004) have shown that there is significant overlap between depression and anxiety during pregnancy, and that anxiety during pregnancy predicts depression in the postnatal period.

Likewise, having prior experience of pregnancy-related trauma such as miscarriages, stillbirths or abortion of an unintended pregnancy, or a history of sexual abuse has been correlated with small to moderate increased risk for depression during pregnancy (Alder, et al., 2007; Lusskin, et al., 2007; Sawyer, et al., 2010).

Individual socio-demographic variables such as age and education appear not to influence psychological vulnerability for antenatal or postnatal depression, as has been evidenced in non-pregnant samples, although teenage mothers under the age of 18 years appear significantly more at risk (Robertson, et al., 2003).

2.4.3.3 Social risk factors

Literature on antenatal and postnatal depression is unequivocal in its association between social support (both perceived and instrumental) and depression (Beck, 2002; O'Hara, 1986; O'Hara & Swain, 1996). Social support includes support from partners, family, friends or health care providers and can include informational, instrumental (or practical) and emotional support.

Low levels of social support have also been consistently associated with depression in low and middle income countries (Wachs, et al., 2009).

The perception of social support among depressed women has been shown to be as important as the presence or absence of social support in reality (Robertson, et al., 2003). O'Hara, Rehm & Campbell (1983) suggested that women's perceptions of support from their husband or family may have a greater association with depression than the actual lack of support. It is possible that the presence of depression mediates the perception of support. Curtona (1984) found that availability of companionship and a sense of belonging were more important than spousal intimacy. Perceived social isolation in pregnancy is a strong risk factor for depression in the postnatal period (Robertson, et al., 2004).

Marital status per se has shown little or no association with antenatal depression (O'Hara & Swain, 1996), however, the quality of the intimate relationship with a partner and marital difficulties have also been associated with antenatal depression (Lancaster, et al., 2010; Robertson, et al., 2004). Bilszta et al., (2008) have shown that women in unsupportive partnered relationships are at elevated risk for antenatal depression as compared to single women and this is supported by research in Africa (Kaaya, Mbwapo, Kilonzo, et al., 2010). Milgrom et al., (2008) in their study of 12,361 Australian women showed that a low level of partner support during pregnancy was independently and significantly associated with postnatal depression. A poor relationship with a partner has been shown to be related to postnatal depression in South Africa (Ramchandani, Richter, Stein, & Norris, 2009; Spangenberg & Pieters, 1991) and also in other research in Africa (Sawyer, et al., 2010).

Likewise, O'Hara (1986) suggests that there is an important protective contribution to having a 'confidant' during pregnancy and the postnatal period, and the degree to which the spouse or partner or any significant other acts as an available emotional support. Increasingly research is suggesting that poor emotional support from the partner and father of the baby has an impact on the level of depressive symptomology that develops (Robertson, et al., 2003).

In a review of research in Africa, Sawyer and colleagues (2010) found that one study on pregnancy showed that marital status was associated with depression, with women who were either single, separated or divorced or in a polygamous marriage being more likely to be

depressed (Adewuya, et al., 2007). The review also found that social support was consistently related to mental health. Particularly, women identified with depression were more likely to report a lack of social support from their family and partner (Adewuya, et al., 2007; Alami, et al., 2006; Esimai, et al., 2008).

Much less literature has examined the association between social support structures, cultural ritual and social practices which may be associated with depression. However, Posmontier and Horowitz (2004) argue that much of the protection hypothesized by traditional practices is operationalised through social support which is absent in modernised societies. Those cultures which: provide a postnatal social structure, recognise the vulnerability of the new mother, mandate a rest period and social seclusion with high levels of practical support from family members and show recognition to the role and status transition of the new mother tend to be associated with lowered depression. These authors argue that the factors that lower maternal depression are facilitated by social support rather than culture per se.

Research in Western contexts supports the argument that during pregnancy women's roles and identity become subject to redefinition and reorganization (O'Hara, 2009), and that women's experience of rapid changes to their normal way of being may be at elevated risk for depression. Literature has shown that pregnancy itself is a stressful life event that places women at increased risk of psychological distress (Luskin, et al., 2007).

The relationship between life events and the onset of depression is well established outside of childbearing, with bereavement, death, unemployment and relocation all being known to cause stress which can trigger depression in individuals without a history of depression (Brown & Harris, 1978). Similarly, negative life events such as bereavement, trauma or pregnancy complications have been associated with antenatal depression (O'Hara, 2009). While findings are limited by retrospective design and self report bias there has been a strong to moderate relationship reported in the literature between experiencing a negative life event and maternal depression, although cross cultural examination suggests this may be culture-specific, and is less so for example in Asia, than it is in the United Kingdom or North America (Robertson, et al., 2004). Beck (2001) took a slightly different approach and examined a broader concept of "life stress" among pregnant and postnatal women, allowing for perceived stress also

to be considered. The results of these meta-analyses of 2300 women showed a moderate relationship between higher levels of life stress, perceived stress and maternal depression.

Interpersonal risk factors are seen to be more influential than socio-demographic factors on their own. Lack of social support and social conflict are both known to be significant predictors of depressive symptoms (Orr, 2004), with social or interpersonal conflict being considered the stronger predictor of the two (Westdahl et al., 2007). Research in South Africa (Ramchandani, et al., 2009) and in Nigeria (Abiodun, 2006) found that family conflict was associated with depression. Research has also shown an association between depression and domestic violence (Lancaster, et al., 2010).

2.3.4.4 Trimester-specific risk factors

While most available research suggests that vulnerability to maternal depression does peak in the early postnatal period (when women are three times more likely to become depressed than non-pregnant women) pregnancy is still seen as a considerably vulnerable period, particularly as pregnancy advances into the second and third trimester.

Bennett et al. (2004) examined risk across the three trimesters and found that the rates observed in the first trimester are similar to rates seen in the general female population, while second and third trimester rates are higher than those observed in the general population. These authors hypothesize that increased rates evident in the second and third trimester may reflect the increased demands of pregnancy and that later pregnancy may present an innate vulnerability to depression or that later trimesters introduce psycho-social stressors associated with risk for depression. However, these authors caution that the confidence intervals of estimates by semester overlap substantially, indicating that given available evidence, while there may be some differences by trimester, the prevalence of depression during pregnancy cannot be said to differ significantly.

There are also two limitations in current literature on depression across the trimesters which may result in the underestimation of depression in the first trimester. Firstly, very few studies include women in their first trimester and hence estimates are based on very small samples. It is plausible that often women may not know they are pregnant and thus be excluded from research. Further, it may be suggested that women who are depressed may delay entry to

antenatal care as argued in a review by Gavin et al. (2005) who using broader diagnostic criteria found increased risk in the first trimester, although this review was limited to high income countries.

In low and middle income country research, a recent study in China found increased vulnerability in the second as opposed the third trimester, but differences were small (9.9% as compared to 7.8%) and the study did not examine risk in the first trimester (Ying Lau, Wong, & Chan, 2010). In Morocco, Alami and colleagues (2006) found very little difference in antenatal depression across the three trimesters, with rates of 17.4%, 16.0% and 15.7% respectively. Esimai et al., (2008) in research in Nigeria found inconsistent rates over the pregnancy and a distinct increase in rates in the third trimester (8.7% in the first trimester, 4.3% in the second and 14.6% in the third).

A recent study by Bunevicius et al. (2009) in Lithuania has offered important initial insights into the timing and risk for depression during pregnancy. These authors examined risk factors by trimester and similar to Gavin et al. (2005), demonstrated higher prevalence in the first trimester. These authors also found that particular risk factors, including an unplanned or unwanted pregnancy and high neuroticism, were independent predictors of depression throughout all three trimesters of the pregnancy, while other determinants such as low education and a history of depression were associated with depression at the beginning of the pregnancy, and psycho-social stressors were associated more frequently with depression at the end of pregnancy. Hence, risk factors may, to some extent, be trimester-specific.

While greater clarity is required on trimester-specific risk and the role of minor depression in the development of major depression, what is unequivocal in the current literature is that when one uses only strict diagnostic criteria for major depressive episodes (which represent the greatest and most accurate estimate of risk for depression) the second trimester and the first 3 months postnatal are the two most significantly vulnerable periods for onset of perinatal depression among pregnant women and new mothers (Gavin et al., 2005; Lusskin, et al., 2007).

2.3.4.5 Environmental factors

Chronic social stressors such as financial difficulties, unemployment, low income, and maternal occupation have a small but significantly predictive relationship to antenatal and postnatal depression consistently across cultures and countries (Luskin, et al., 2007; Robertson, et al., 2004). Global research has for some time concluded that minority groups and lower socio-economic groups may be at elevated risk for depression across the lifespan regardless of the antenatal or postnatal risk periods (Bennett, et al., 2004; Yonkers et al., 2001).

Poverty and high levels of economic stress has consistently been associated with depression in low and middle income countries (Ahmad & Khan, 2005; Husain, Creed, & Tomenson, 2000; Mirza & Jenkins, 2004; Patel, et al., 2007; Rahman & Creed, 2007). Das, Do, Friedman and McKenzie (2009) examined the effect of socio-economic status and mental illness in five low and middle income countries and have shown that contrary to expectations, there is little observed relation between mental health and consumption poverty or education, two common measures of socioeconomic status. Instead, the results suggest that economic and multidimensional shocks, such as illness or crisis, can have a greater impact on mental health than poverty.

A recent systematic review (Lund et al., 2010) of poverty and common mental disorders (including depression, anxiety and somatoform disorders) in low and middle income countries, illustrate that there is increasing evidence to support a social causation hypothesis between poverty and mental illness. This suggests that the circumstances of poverty such as social exclusion, high stressors, reduced social capital, malnutrition, obstetric risks and increased violence and trauma can be positively linked to increased risk of common mental disorders. This hypothesis is more frequently evidenced for disorders like depression.

Thus, there is growing evidence, in both low to middle income and high income countries, that lower socio-economic status may have a direct effect on the risk for depression and other psychiatric disorders. Lowered socio-economic status may introduce more economic shocks in response to stressors and may also be associated with a multitude of indirect risk factors for depression, including increased rates of unwanted pregnancies, increased domestic violence, lowered social support or access to health care, and elevated lifetime risk for

psychiatric disorders (Patel, Kirkwood, Pednekar, Weiss, & Mabey, 2006). Given the extent of poverty and economic stress in low and middle income countries, and the lowered autonomy of women in those settings, significant concern has been raised regarding antenatal and postnatal depression in these contexts.

2.3.5 Summary of maternal depression in the global context

- Prevalence of antenatal depression falls in the range of 7 and 18% in high income settings and 25 and 40% in low to middle income countries.
- Pregnant women have not been shown to be more vulnerable to depression than non-pregnant women, but the early postnatal period is a period of significant risk when compared to non-pregnant women.
- In low, middle and high income countries women from lowered socio-economic status groups are at increased risk for depression. Emerging evidence suggests that depression is less related to consumption poverty and more related to levels of economic stressors or shocks.
- The strongest predictor of antenatal depression is the presence of a previous history of depression. Likewise, a previous history of depression and the presence of depression or anxiety during pregnancy are the strongest predictors of postnatal depression.
- Women, who have recently experienced a stressful life event; who perceive or actually have low levels of social support; or who experience conflict in their intimate relationships and are socially isolated during their pregnancies are at moderate risk of antenatal and postnatal depression.
- Women who have high levels of neuroticism, obstetric complications or chronic illness during pregnancy or a prior history of trauma are at risk for antenatal and postnatal depression.
- Risk factors are cumulative and interdependent, and while all trimesters of pregnancy may introduce vulnerabilities and stressors, the second and third trimesters have been shown to have increased risk.
- Specific risk factors influence the development of depression at different times during pregnancy. There are several risk factors and pregnancy related events which may impact on

each other and on the development of depression through complex pathways, and little is known about interactional effects and direction of causation.

- Antenatal depression has been associated with poorer foetal and delivery outcomes, increased risk behaviours, and poor uptake of antenatal care. Antenatal depression is of concern because it increases the likelihood of postnatal depression which has implications for child development.
- Low and middle income countries have higher risk of maternal depression than high income countries. Very little is currently known about antenatal depression globally, and in Southern Africa particularly.
- Despite increased research into antenatal depression, there is still considerable uncertainty as to the numbers of women affected, the timing, and the presentation of antenatal depression.
- The generalizability of research findings on antenatal depression is limited by the heterogeneity of study results, the small sample sizes, variability in sampling points during pregnancy and the inconsistent use of diagnostic criteria.
- Research to date has been limited by the possibility of detection bias, difficulties in distinguishing underlying risk from risks that emerge during pregnancy and by issues of cross-cultural variation.

2.4 Part 3: Maternal depression in the Southern Africa context

This section of the review will summarise existing research in Southern Africa and South Africa on antenatal and postnatal depression. The risks introduced by HIV in Southern Africa are described.

2.4.1 The prevalence of maternal depression

There is no published research to date, outside of this study, which examines antenatal depression in South Africa. In South Africa, published research has focused on the postnatal period.

In early research, Lawrie and colleagues (1998), as part of the preparation for a clinical trial to examine the effects of progesterone as treatment for postnatal depression, validated the EPDS in a sample of 102 women recruited in a clinical setting in Johannesburg. These authors found the prevalence, using a cut off of ≥ 12 on the EPDS at 6 weeks postnatal, to be 36.9%. The clinical trial later found that progesterone was not effective as a treatment for postnatal depression, and that it in fact increased the risk of depression (Lawrie, et al., 1998).

In Cape Town in the late 1990's Cooper et al. (1999) assessed women in preparation for a clinical trial to improve the quality of mother-child interaction, maternal sensitivity and attachment. Among 147 women who were assessed at two months postnatal using a structured interview, these authors found a prevalence of rate of 34.7%. Factors significantly associated with depression were found to be low birth weight and an unplanned or unwanted pregnancy. Associations which may indicate a trend were also seen with other variables including: age, education, housing type, marital status, parity, mode of delivery and infant gender, but none of these associations were statistically significant at a $p < 0.50$ level.

Similarly, in South Africa Spangenberg and Pieters (1991) assessed 81 postnatal women using the BDI at two weeks and 6 months postnatal and found a period prevalence of 27.2%. Factors associated with depression in this study included age, parity, mode of delivery and preterm delivery. More recently, also in South Africa, Madu and Roos (2006) examined risk for depression among 100 women (50 with preterm deliveries and 50 full term controls). Assessing them using the EPDS at one week postnatal, they found a prevalence of 48% among mothers

with preterm deliveries and 32% among mothers with full-term deliveries. Factors associated with depression included marital status and a lack of partner support, parity, place and mode of delivery and having a preterm infant.

Ramchandani et al. (2009) analysed data from a longitudinal cohort of mother child dyads in Johannesburg and found prevalence of 16.4% among 1035 women using the Pitt Depression Inventory. Factors significantly associated with depression included education, family conflict, unhappiness and a lack of support during pregnancy.

Further afield in Southern Africa, Stewart et al. (2009) in Malawi examined postnatal depression among women and found the prevalence of major and minor depressive episodes to be 30.4%. Prevalence of major depressive episodes alone was 13.9%. In this study postnatal depression was linked to lower socioeconomic status, lack of a confiding relationship with partner or relative, recent infant illness and HIV infection.

In Zimbabwe, research found that 33% of postnatal women met the criteria for major depression and that HIV positive women had higher mean depressive scores than HIV negative women (Chibanda et al., 2010b). In examining whether access to antiretroviral treatment (ART) improved psychological well being of women in Zimbabwe, results showed that women with HIV who were receiving antiretroviral treatment had significantly less depression than those who were not receiving antiretroviral treatment (R. Patel et al., 2009). The two control groups in this study included women who were eligible and awaiting initiation and those who were not yet eligible for treatment, and the difference in depression between the two control groups was not significant.

Hence, while no research on antenatal depression is available, research on postnatal depression suggests that risks for maternal depression are high in the Southern African context. Given that antenatal symptoms often precede postnatal depression and since antenatal depression is known to be the strongest predictor of postnatal depression (Robertson, et al., 2004), developing an understanding of antenatal depression in South Africa is an important research agenda.

2.4.2 Vulnerabilities and stressors in the antenatal period in Southern Africa

Desjarlais, Kleinman, Eisenberg and Good (1995), and more recently Brandt (2009) argue that several social factors are important to consider when examining threats to women's mental health in Southern Africa, and particularly in more Southern countries such as South Africa and its neighbours: Malawi, Lesotho, Zambia, Zimbabwe, Swaziland and Mozambique. The vast majority of pregnant women in these countries find themselves in similar predicaments; they are exceptionally poor, struggle under the burden of gender inequalities, have little or no social safety net and are likely also highly vulnerable to HIV.

Africa has the highest proportion of people living in extreme poverty in the world and in 2010 according to the United Nations annual listing of least developed countries, 33 of the 50 nations on the UN list are in Africa, five in Southern Africa. Further, given South Africa's complex socio-political history, the socio-economic ills brought about by apartheid (along with its implications for mental illness), and social exclusion (Du Toit, 2004), it is likely that there is a particular risk for depression in this context.

Research in South Africa has shown concerning vulnerabilities amongst women generally and specifically during pregnancy. Studies have showed high rates of gender inequality and intimate partner violence during pregnancy (Dunkle et al., 2004), linked in turn to depression and risk of HIV (Jewkes et al., 2008). The relationship between depression and intimate partner violence (frequently including emotional abuse), and a lack of relationship power is also commonly reported in the literature (Jewkes, Dunkle, Nduna, & Shai, 2010; Ketchen, Armistead, & Cook, 2009).

There is increasing evidence that depression is highly co-morbid with HIV and in Southern Africa this may be an important factor in the examination of mental health in the antenatal and postnatal period (Brandt, 2009). In particular antenatal depression is an important area of research because rates of HIV are very high amongst young women of child-bearing age and most women will learn their status for the first time during antenatal testing (Shisana et al., 2005). Learning one's HIV status can be distressing and stressful and may introduce, or further compound, current risks of depression in the antenatal period (Lester, et al., 1995).

Sandelowski and Barroso (2003) conducted metasynthesis of 45 qualitative studies on HIV-positive motherhood and found that negative taxonomies were common to the experience of HIV-positive motherhood. Furthermore, HIV during pregnancy often introduces emotional difficulties and stressors as mothers begin to see themselves in terms of a deviant motherhood status, which is accompanied by feelings of remorse and inadequacy, often resulting in barriers to seeking antenatal care and support. In addition, qualitative work has highlighted the complex calculations women need to make between the risks and the benefits of health and social decision making in order to ensure prevention of transmission, in particular as relates to disclosure and compliance to preventative medication, which could be further compounded by antenatal depression.

Co-morbid depression and HIV infection in pregnant women raises a number of issues not pertinent to non-pregnant women. Antenatal depression is known to reduce engagement with antenatal care and to increase health risk behaviours in other low income countries (Patel, et al., 2004), and it is possible that in high HIV prevalence areas antenatal depression may limit the success of prevention of mother-to-child transmission programmes (Msellati, 2009; Raisler & Cohn, 2005).

As Prevention of Mother to Child transmission Programmes (PMTCT) have evolved there has been discussion in the literature regarding the ethical considerations and approaches to testing during pregnancy in particular as relates to informed consent and choice (Sherr, Bergenstrom, & Hudson, 2000). Qualitative research has raised concerns about needs to protect women's rights to consent, and to ensuring that HIV testing is sensitive to the far reaching implications of learning that one is HIV positive during pregnancy (de Zulueta & Boulton, 2007).

A review by de Bruyn and Paxton (2005) highlights concerns around HIV testing during pregnancy in low and middle countries where services and women's autonomy are often limited. These authors argue that in these settings women are often blamed or stigmatised as the 'HIV infector' if they are the first to test in a partnership. Furthermore, fear of or actual experience of stigma and discrimination results in low disclosure, lowered support and minimal partner engagement in PMTCT. As a result, in many instances, women are expected to carry a significant and disproportionate load of the burden of responsibility towards PMTCT. Many of

these experiences may contribute to the development of psychological difficulties or may worsen existing difficulties.

While recent studies in Southern Africa including South Africa, Botswana and Zimbabwe show that opt out testing and group counselling approaches to HIV testing in poor resource settings are relatively successful and acceptable to women, see for example (Mugore, Engelsmann, Ndoro, Dabis, & Perez, 2008), very little is known about how or whether mental health or illness interacts with testing, decision making and experiences of PMTCT. Preliminary evidence suggests that depression may impact on a woman's ability to engage with HIV testing and preventative programming, and may alter her perceptions regarding the consequences (health care or otherwise) of testing for HIV during pregnancy (Rochat, et al., 2006).

Existing literature on HIV treatment adherence suggests that mental health issues may be a barrier to treatment adherence, and the presence of social, emotional and material support influences adherence positively (Ammassari et al., 2002; Mills et al., 2006). As treatment programmes begin to move to scale and increasingly pregnant women become more eligible to begin HAART for life during pregnancy, concerns are raised by evidence that untreated depression in women (albeit outside of the context of pregnancy) is known to be associated with lowered uptake of antiretroviral treatment (Cook, et al., 2006), lowered adherence to antiretroviral medication (DiMatteo, Lepper, & Croghan, 2000; Starace et al., 2002), and increased disease progression (Ickovics et al., 2001). Similarly some HAART medications, such as Efavirenz, are known to include psychological difficulties among their side effects.

2.4.3 The role of culture in the study of depression in Southern Africa

The review of literature thus far has outlined the extent of antenatal depression in the global context, its impact on maternal and child health and has made an argument for the importance of research on antenatal depression in Southern Africa and in South Africa.

A growing body of literature has also drawn attention to issues of culture and the importance of cross cultural sensitivity in the study of depression, particularly as it relates to childbearing (Oates et al., 2004), a highly contextualised and cultural event. Robertson et al. (2003), in a comprehensive review of literature on postnatal depression, illustrate that there is a significant bias in the literature, with most studies being undertaken in developed and high

income countries. Research from low and middle income settings and developing contexts has begun to highlight issues of cultural diversity in women's experiences of childbirth and depression.

The literature on the study of depression in cross-cultural contexts raises two concerns: (i) that the contextual factors (risk and protective) which frame a women's experience of depression in different cultures may differ and (ii) the methodological approaches to the measurement of depression which use diagnostic tools that have been validated predominately in developed settings may not be valid in less developed contexts, and in contexts with greater cultural diversity.

2.4.4 Concerns about the culture-bound nature of depression

Of concern in the literature is the possibility that the defining criteria for depression may differ cross culturally or that cultural frameworks around social support and the value of childbearing may result in risk and protective factors being experienced differently. Debate over possible cross-cultural influences and how they may affect the existence of and the study of maternal depression are long standing.

The historical origin of this debate can be traced back to the work of Stern and Kruckman (1983), who reviewed anthropological literature and argued that maternal depression was a culture-bound phenomenon and did not exist in what these authors referred to as "*non-Western*" cultures. The terms *Western* and *non-Western* should be used, read and interpreted cautiously given problems of definition around geography, technology and culture, however, they are used in this review since they accurately and adequately portray Stern and Kruckman's theory, and its limitations. These authors theorised that maternal depression was rare in non-Western cultures as a result of specific cultural practices that provided social support structures which facilitated the transition to motherhood. These authors hypothesised that the absence of social support in Western culture resulted in postnatal depression.

More recently evidence in the literature has indicated that postnatal depression crosses cultural boundaries and is not a culture-bound illness (Affonso, De, Horowitz, & Mayberry, 2000). In addition, the terms Western and non-Western may no longer be adequate to describe global cultural variation in postnatal practices. This is particularly so because some of the

practices described by Stern and Kruckman (1983) have been found in cultures within so-called Western societies. Posmontier and Horowitz (2004) cite the Amish culture in the United States as one such example, and propose that the differences evident in certain cultures around structured social support to mothers and periods of confinement which are hypothesised to have a protective effect are better described as:

Technocentric: to describe cultures which rely heavily and focus on information and technology as a means to ensure the well being of the mother and the infant.

Ethnokinship: to describe cultures where social support rituals by family networks are the primary focus in ensuring maternal and child well being.

Posmontier and Horowitz (2004) argue that these revised terms are less defined by geography and more defined by modernization and social practices. Similarly it is important to remain cognisant that regardless of geographic location, ethnokinship culture may exist within a dominant Western culture, and a technocentric culture may exist within a non-Western culture. Technocentric and ethnokinship approaches are also not mutually exclusive.

The issues raised by this cross-cultural debate relate to the idea that pre and postnatal access to health care and quality of care, actual and perceived levels of social support, poverty and socio-economic stressors, attitudes towards childbearing, gender roles, religious customs, attitudes towards mental illness, biological vulnerabilities, and approaches to nutrition are all bio-psycho-social factors that are subject to culture-specific interpretations that may influence the reporting of and experience of depression during pregnancy and the postnatal period. In some ethnokinship settings cultural patterns which reinforce and support the transition to maternal roles may offer protection from psychological burdens, while in other similar ethnokinship settings these cultural traditions may be perceived as stifling, or may offer little realistic protection given other severe vulnerabilities, for example, in the settings of extreme poverty in some countries in Asia or Africa.

Bina (2008), in a review of the impact of cultural variables on the experience and recovery from postnatal depression, found that while many studies emphasise the impact of

culture on the diagnosis and identification of depression, very few examine the possible impact culture may have on alleviating depression. This review found that five studies, one from Kenya, three from Asia and one from the United States reported an alleviating impact of cultural practices, in particular practices involving mandatory postnatal rest periods. However, many studies in this review showed a neutral effect, or demonstrated that cultural factors such as gender inequality and infant gender bias played a negative role in recovery from postnatal depression. Many of these studies are methodologically limited and have poor generalizability given their heterogeneity, small sample size, the lack of a validated assessment of depression and the diversity of measurement time points in the postnatal period.

Swartz (1998) suggests that a meaning centred approach is critical in developing a culturally sensitive understanding of depression, since this approach allows for the examination of the context in which symptoms are important or unimportant. It allows for an understanding of how women within a particular cultural context may perceive and experience their own lives as lived, and how depression may be intertwined with that. In addition, this meaning centred approach can assist in ensuring that contextual factors which may contribute to depression are identified and can thus be considered in the design of culturally acceptable interventions.

Bolton and Tang (2004) have shown how using ethnographic approaches can enhance the validity of depression assessments through the collection of qualitative data on how people within a specific culture experience their social world and view mental health problems and perceive threats to their own mental health. Similarly, Prince (2008) suggests that in order to attend to issues of cultural sensitivity, formal assessments of depression should be complemented by qualitative research to investigate the cultural relevance and social milieu within which participants live and experience these perceived or actual threats to their mental health.

2.4.5 Cross-cultural validity and the study of antenatal depression

The second issue raised in the literature relates to the ability of depression assessments to accurately measure the construct of depression. Halbreich and Karkun (2006) point out that there are possible differences in symptom definition and the expression of depression across cultures and countries that may complicate the examination of depression.

The concerns are based on assessments of the clinical symptoms of depression largely being validated in high income and developed contexts, which may result in the production of culture-bound assessments. In Africa, a predominately developing, poor continent with many cultures, some research (Hanlon, et al., 2008) has found that commonly used screening tools such as the EPDS, which does not include a somatic component, may be culturally insensitive. There are suggestions made in the literature that depression in some African cultures may include somatisation as an important cultural component of the manifestation of depression (Sawyer, et al., 2010).

However, the EPDS is a measure that was designed to exclude a somatic component in order to improve its specificity during pregnancy and the postnatal period when somatic symptoms that are common to childbearing may overestimate depression. Given these concerns and the concern that most prevalence estimates are based on research from high income countries, Halbreich and Karkun (2006) undertook an extensive review of studies examining the prevalence of postnatal depression in 40 countries in an effort to assess whether the internationally accepted prevalence range of 10-15% was in fact applicable in low to middle income settings.

The review included 143 studies published between 1980 and 2005 on postnatal depression. While the intention was to conduct a meta-analysis, Halbreich and Karkun (2006) argue that the wide range of prevalence (ranging from 0.5%-60%) deems an overall mean which is somewhat meaningless, in particular since this wide across country range did not take into the account the within country cross-culture and diverse socio-economic factors which result in significant heterogeneity.

No disenable pattern could be established in the review to suggest that low to middle income countries are at particular risk of postnatal depression. A mix of low to middle and high income countries have low risk, for example in Singapore, Malta, Denmark and Malaysia prevalence rates are 0.5-9% (Felice, Saliba, Grech, & Cox, 2004; Forman, Videbech, Hedegaard, Salvig, & Secher, 2000; Kit, Janet, & Jegasothy, 1997; Kok, Chan, & Ratnam, 1994) while an equally diverse group of countries: Costa Rica, Italy, South Africa, Korea and Taiwan

have high prevalence in the range of 34-57%. (Affonso, et al., 2000; Benvenuti, Ferrara, Niccolai, Valoriani, & Cox, 1999; Lawrie, et al., 1998; Wolf, et al., 2002).

These authors (Halbreich, et al., 2007; Halbreich & Karkun, 2006) suggest that some of the differences may be accounted for by inconsistency in the sensitivity and specificity of the EPDS or by other methods of assessment used in the global literature. Specific methodological concerns are raised including:

- Concerns that normal postnatal symptoms unrelated to depression may be similar to symptoms of depression and may inflate scores in some settings where structured interview methods are not used, while episodes of mild depression, more common to particular socio-economic groups may be missed by structured interviews.
- Concerns that since prevalence rates are much lower when structured interviews are used, these measures may reflect only a narrow aspect of postnatal depression which may have less cross-cultural applicability. The relevant advantages and disadvantages of using self report versus structured interviews in cross-cultural settings are thus currently unclear.
- Concerns that there may be reporting bias in the way that women from different cultures respond to self report measures due to their culture-specific beliefs and attitudes, and concerns regarding stigma about reporting mental illness symptoms in the childbearing period. As such there may be differences in symptom recognition and expression distinct to non-Western cultures which may explain the differences in very low or very high reporting in some of those contexts, in particular those using self report measures.

Evidence in support of the cross cultural limitations of assessment tools and distinctly somatic expressions of depression in Southern African contexts are far from unequivocal. For example, the EPDS has been successfully validated for use in several countries including Nigeria, Malawi, Zimbabwe and South Africa (Adewuya, et al., 2007; Chibanda, et al., 2010a; Lawrie, et al., 1998; R. Stewart, et al., 2010) while in a predominantly rural population in Ethiopia, Hanlon and colleagues (2008) found that the EPDS had poor validity as compared to the self report questionnaire (SRQ). Less than a year later these same authors found that the EPDS performed more than adequately in a more urban population in Ethiopia (Tesfaye, Hanlon, Wondimagegn, & Alem, 2010). In Zimbabwe, early studies on depression made use of the Shona

Symptom Questionnaire (Patel, Simunyu, Gwanzura, Lewis, & Mann, 1997), an indigenous psychiatric questionnaire, while more recently research has demonstrated the effectiveness of the EPDS in pre and postnatal samples in Zimbabwe (Chibanda, et al., 2010a).

In South Africa, Swartz (1998) has presented clinical case evidence that the inclusion of metaphysical stories around witchcraft and ancestral belief systems or the somatisation of emotional symptoms influenced reporting of depression. Therefore, depression may be missed because it does not present as expected on standardised measurement tools. Caution is required in assessing a localised and context-bound understanding of antenatal depression.

In a review of evidence in support of a culture-bound postnatal depression, Posmontier and Horowitz (2004) found that reports of culture-bound manifestations of maternal depression are highly variable and uncommon. This variation may indicate that manifestations vary by culture, or that cross-cultural diagnostic standards do differ from Westernised clinical criteria. But evidence does not support the idea that depression does not exist in these settings, instead it suggests that in some specifically identified cultures it may present differently from the APA norm. On balance, the review by Posmontier and Horowitz (2004) suggests that an expanding global literature has demonstrated that maternal depression occurs in a variety of countries, in a more similar than a different way, and that it can be effectively measured.

Likewise, Patel (2001) showed that as much support can be found for similarities (an etic approach) as for differences (an emic approach) in the international epidemiology of depression. This is since the clinical presentation of depression in all cultures is associated with multiple somatic symptoms of chronic duration. Psychological symptoms are also equally important to the diagnosis of depression, and can be easily elicited in most settings.

2.4.6 Summary of maternal depression in the Southern African context

- Research in Southern Africa has focused on postnatal depression and shows that rates of depression in the postnatal period are high.
- Women in Southern Africa face multiple and cumulative risks that significantly increase their risk of depression during the antenatal and postnatal period.

- Preliminary evidence suggests that HIV may play an important role in increasing risk in areas of high prevalence, either directly through infection or indirectly through its association with other risk factors.
- Cultural variables may influence how individuals in different cultures report their symptoms of depression and may result in more somatic than psychological symptoms being reported.
- While there is very little evidence of a culture-bound maternal depression in the global literature, some evidence in South Africa cautions that this may be the case.

Chapter 3

Methodology

3.1 Introduction

This chapter is organised into three parts.

Part 1: Methodological approach and the research context

The first section of this chapter outlines the methodological steps taken to improve the cultural sensitivity and validity of the study. This is followed by an introduction to the research context, including a description of the geographical region where this study took place and the African Centre for Health and Population Studies demographic surveillance area. Peer reviewed published data is used to present a summary of known population dynamics, HIV prevalence and health care services in this community. This section ends with a summary of the results of the baseline screening study which preceded this study.

Part 2: Research design, study preparation and procedure

The section begins with a description and diagrammatic overview of the research design. This is followed by a discussion of the study preparation, including a description of the translation and preparation of assessment measures, preparation of the research site and piloting activities. Thereafter, the study procedures are outlined, including the recruitment procedures, inclusion and exclusion criteria, and the ethical considerations and clearance for the study.

Part 3: Data collection and data analysis

This section of the chapter is organised by method (either quantitative or qualitative) and provides a description of each of the five assessment measures. This section ends with a description of the data entry, preparation and analysis steps, outlined by assessment measure and method.

3.2 Part 1: Methodological approach and the research context

The purpose of this section is twofold: Firstly, the section addresses how, given issues raised in the literature, cultural sensitivity and validity was approached in this research. Secondly, in order to provide the reader with an adequate contextual background with which to interpret the results, an informative overview of the demographic, social, economic and health care context of the research population are presented.

3.2.1 Methodological approach, cultural sensitivity and validity

The review of literature outlined shows a cognisance of the limitations associated with the study of depression in cross-cultural settings. Particular concerns were raised regarding methodological approach for two reasons. Firstly, contextual factors may influence how individuals in different cultures perceive psychological and social stressors. Secondly, culture and language may influence how antenatal depression is reported, experienced or responded to. The literature offers recommendations to address the issue of cultural sensitivity and validity. Rogler (1989) proposes that undertaking culturally sensitive mental health research should include the entire research process, and calls for thoughtful design and use of multiple methods, adequate piloting and pretesting, careful translation and planning, and interrogation of contextual factors during analysis and interpretation.

In keeping with these recommendations, this research took as a starting point that the psycho-social and cultural world of the women engaged in the research is complex and multi-faceted, and that complex methodology is required in order to ensure cultural sensitivity in our understanding of depression. To this end, a combined methodological approach was designed to include both quantitative and qualitative research techniques. The use of more than one method in social science research is not new (Fielding & Schreier, 2001) and more recently, has been actively promoted in particular in research concerning social problems and the evaluation of social intervention programmes. It is favoured for its ability to consider many rather than one way of knowing, which is seen to be better suited to the complexity and contextual character of human nature (Greene, Benjamin, & Goodyear, 2001). There has also been a growing trend towards the use of combined methods in understanding health and health behaviours (Deren et

al., 2003; Foss & Ellefsen, 2002). The rationale for using a combined methods approach in this research was fourfold:

- Firstly, to increase the accuracy of the findings and the level of confidence in them (Kelle, 2001).
- Secondly, in order to generate new knowledge through a synthesis of findings from different approaches (Foss & Ellefsen, 2002).
- Thirdly, to introduce different voices and to bring into play multiple constructions of a single phenomenon (Moran & Butler, 2001) and
- Fourthly, to reflect the complexity and multifaceted ontology of a phenomenon (Coyle & Williams, 2000; Deren, et al., 2003).

The theoretical position of this research is that depression is a complex phenomenon which comes about as result of interaction between innate vulnerabilities and psychological and social risk factors as described by vulnerability-stress models. As such, the use of a mixed method approach in this research aimed to produce a more accurate understanding of the social epidemiology of depressive, but also the psycho-social context in which depression occurs, which may increase risk, offer protection or influence health related behaviours, and about which very little is known in this particular cultural context.

While the methodological approach attempted to capture complexity, limits were set in the design and development of this research. While diagnostic method and assessment needed to be culturally sensitive, and to attend to concerns which are raised in the literature, this research was conducted primarily to estimate prevalence derived from a validated diagnostic measure (a structured clinical interview) which had epidemiological validity for this population. While the research aimed to remain sensitive to cultural contextual factors, the scope of this research did not include undertaking an anthropological exploration of in-depth cultural experiences of depression or mental illness during pregnancy. As such the assessment of depression attempted to be both culturally sensitive and diagnostically valid, and in line with the DSM-IV-TR (2000) criteria.

In the local adaptation of the structured interview, caution was taken not to change any diagnostic criteria, but rather to adapt the diagnostic interview style and offer culturally relevant

probes and examples, and to allow for meaning and context to be captured in qualitative note-taking. Protection against diagnostic over-adaptation was considered important, as Canino, Lewis-Fernandez and Bravo (1997) caution; a careful balance needs to be found between sensitivity and validity. They argue that researchers need to question how much local cultural diversity can be incorporated into an established diagnostic instrument before the degree of alteration renders the instrument incapable of measuring the original constructs for which it was designed (Canino & Alegría, 2008).

Maser, Kaelber and Weise (1991) have illustrated in an international survey of 146 mental health professionals in 42 countries, that careful attention to cross-cultural factors, and making use of diagnostic interviewing methodology which is sensitive to culture has resulted in a high acceptability and usefulness of the DSM-II-R, and in growing consensus in psychiatric classification. Further, Stein (1993) illustrates how with relative ease, cross-cultural factors can be accommodated within the axis system without compromising diagnostic validity.

Similarly, in ensuring cultural validity on rating scales, such as the Edinburgh Postnatal Depression Scale (EPDS), these rating scales were not substantively changed, however, rigorous translation and back translation (Sperber, Devellis, & Boehlecke, 1994); in-depth cultural sensitivity training of assessment interviewers (LoboPrabhu, King, Albucher, & Liberzon, 2000); and careful piloting of assessments were considered important methodological steps to enhance the cross-cultural validity (Bhui, Mohamud, N., Craig, & Stansfeld, 2003).

Lastly, Prince (2008) suggests that the examination of maternal depression in distinct cultures is feasible when specific steps are undertaken to ensure cultural validity. These include, as already outlined above, the careful translation of assessment measures, ensuring attention is paid to local language, and the construct of depression as expressed in local culture, and adequate piloting and pre-testing to ensure that cultural constructs are adequately captured. Further to this, Prince suggests that complimenting quantitative assessment with qualitative data collection to explore women's experiences of pregnancy and child birth, as well as the cultural relevance of contextual factors, brings significant value to the research design. This recommendation was included in the design of this study and a sub sample of women completed an in-depth qualitative interview in order to ensure that women's experiences were considered and included in the research.

In addressing cultural sensitivity in psychiatric diagnosis Rogler's approach was applied to this research (Rogler, 1989, 1996). In the first instance, a clear hypothesis was formulated and developed based on existing literature on South African and Southern African cultural experience, nuances and manifestations related to depression (Patel, Abas, Broadhead, Todd, & Reeler, 2001; Swartz, 1998). Secondly, the role of culture was assessed in terms of individual symptom assessment and in the configuration of symptoms into a disorder. Lastly, a careful review was undertaken of the situation and data collection process using the diagnostic interview. Specifically, qualitative in-depth interviewing skills were considered an important tool in ensuring the clarification of meaning and a culturally sensitive diagnostic method.

The process of data analysis considered multiple perspectives and multiple data sources to ensure a more comprehensive understanding of depression. Historically, the purpose of triangulation has been to increase accuracy and to enable making epistemological claims concerning what more can be known about a phenomenon when different methods of understanding the same phenomena are brought together. In this study, Moran-Ellis and colleagues' (2006) approach towards triangulation is adopted. Triangulation is not only used to find congruence and to strengthen evidence, but also to explore incongruence in findings between methods. Triangulation served the purpose of adding to the depth of understanding across multiple data sources, each with its own a particular advantage (Moran-Ellis et al., 2006).

3.2.2 The research context

In order to increase the relevance of the findings to public health priority areas in Southern Africa, the research was located in a predominantly rural area with high HIV prevalence. The research was undertaken at the Africa Centre for Health and Population Studies (Africa Centre) where annual surveillance of the research community is undertaken. This overview will illustrate that the Africa Centre research community has similar characteristics to that of other developing regions in Southern Africa, and that the health care circumstances of the research community are similar to primary health care settings in other areas in South Africa.

3.2.2.1 The study location

The study took place in Northern KwaZulu-Natal, one of nine provinces in South Africa formed after the 1994 elections. KwaZulu-Natal lies on the east coast of South Africa, bordered by Mozambique, Swaziland, and Lesotho. Geographically, KwaZulu-Natal has three distinct areas: the narrow lowlands along the southern coast; the central midlands which extend to the Drakensburg mountain range in the west; and the northern coastal region which extends to the Lebombo mountainous region running south from Swaziland.

KwaZulu-Natal Province

In 2007, according to Statistics South Africa (StatsSA) the province of KwaZulu-Natal was estimated to have a population of 10,259,230 with a population density of 111.4 residents per square kilometre (Statistics South Africa, 2007). Eighty six percent of the population of KwaZulu-Natal is Black African and the dominant language is Zulu (Statistics South Africa, 2001). Population density in KwaZulu-Natal province is diverse and as illustrated in Figure 3-1, density is highest in the central urban, metropolitan and surrounding areas of Durban and Pietermaritzburg (demarcated by the rectangle in Figure 3-1) with outlying mountainous areas in the far west and northern regions being significantly more rural with lower population density. The geographic area in which this research took place is predominately rural and is demarcated by a circle in Figure 3-1. While the provincial capital is the city of Pietermaritzburg, the largest city in the province is Durban, a rapidly growing urban area hosting one of the largest and busiest ports in Africa.

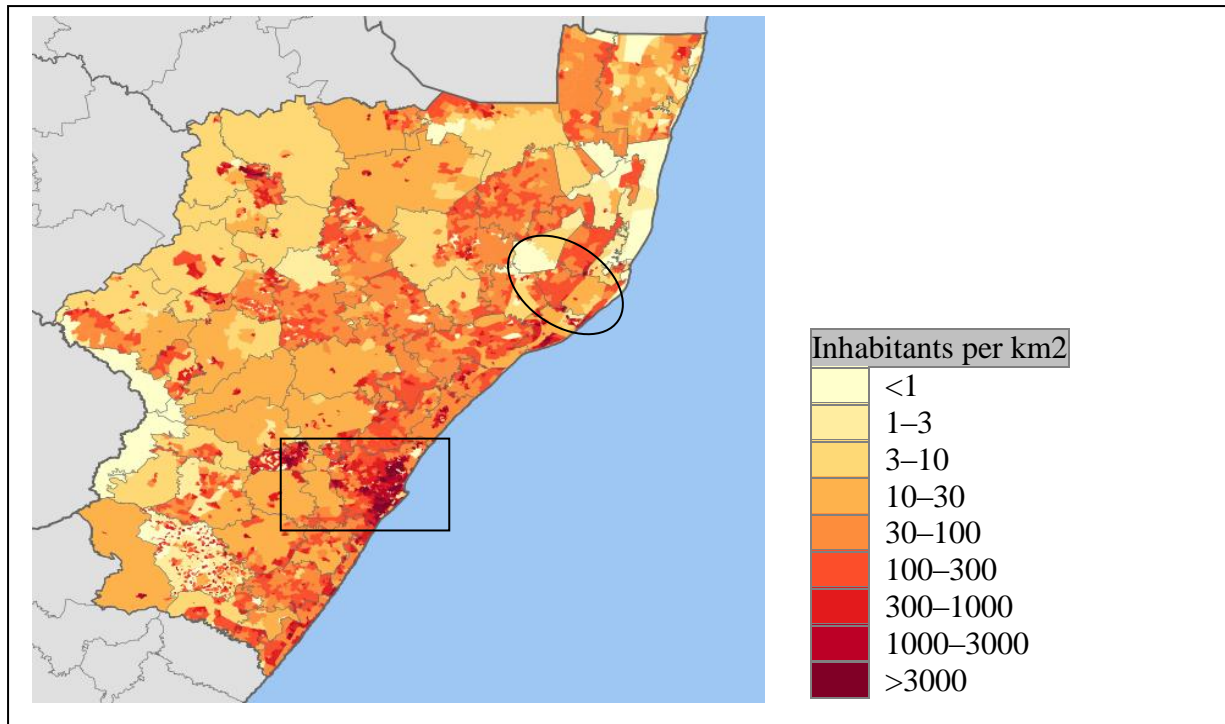


Figure 3-1 Population density of KwaZulu-Natal "Sub place" level (StatsSA, 2001)

Umkhanyakude District

KwaZulu-Natal is divided into 11 municipal and health districts. This research was undertaken in the Umkhanyakude district, the northernmost district of KwaZulu-Natal. It is a rural district, with the largest town being Mtubatuba in the South and the smaller towns of Hluhluwe, Mkuze, Jozini, Kwangwanase and Ingwavuma further north. The district has 5 hospitals and 52 primary health care clinics that service a population of approximately 573,353 residents. Approximately 99.2% of the Umkhanyakude population are Black African; 54.76% female and 45.24% male and close to 60% of the population is under the age of 20 years. The Umkhanyakude district has been described as one of the two most deprived districts in South Africa (Health Systems Trust, 2008). 'Deprivation' is defined as a combination of indicators including unemployment rates, access to piped water and electricity, female-headed households with high numbers of children, and low education levels.

The Africa Centre for Health and Population Studies

The Africa Centre is a Wellcome Trust funded research institute established in 1997 with the aim of providing longitudinal data on the social and health impact of the HIV epidemic in a population undergoing a health transition. This research study was hosted by the Africa Centre.

The Africa Centre undertakes annual demographic and HIV surveillance and in collaboration with the local Department of Health delivers a large HIV treatment, care and support programme with funding from USAID/PEPFAR. Located near the market town of Mtubatuba, 230 kilometres north of Durban, surveillance research is conducted in a demographic and health surveillance area (DSA) spanning 438 square kilometres of the Mpukunyoni tribal area of the Hlabisa sub-district illustrated on the map in Figure 3-2. In this figure, the demographic surveillance area is demarcated in grey, and each of the 17 sub-district primary health care clinics, the Hlabisa hospital and the Africa Centre are shown.

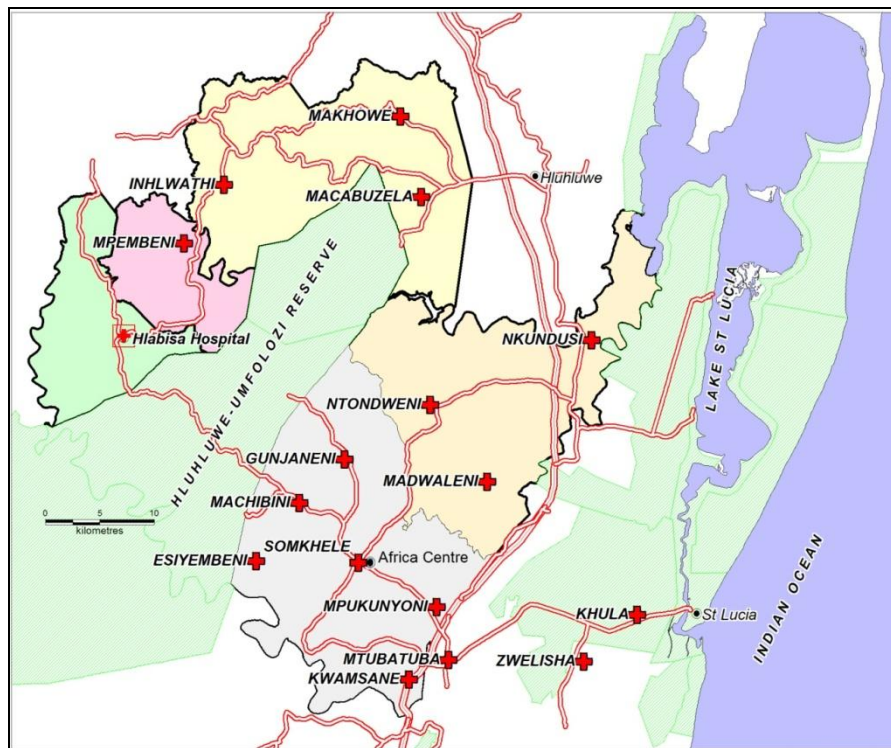


Figure 3-2 Map of the Hlabisa sub-district

The surveillance area is predominantly rural, but contains an urban township (KwaMsane), an informal peri-urban settlement, as is typical in South Africa. The area is characterized by large variations in population densities (20-3000 people per km²) and in the rural areas, homesteads are scattered rather than grouped.

3.2.2.2 The population dynamics of the research community

According to Muhwava & Nyirenda (2008), the population resident in the DSA exhibits the characteristics of a low and middle income country, with a large proportion of the population being children under the age of 15 years, across both sexes. In the resident DSA population the dependency ratios are quite high (88.26%) while the age dependency ratios for non-resident populations is low (34.14% in 2006), suggesting that it is mostly the adult working population which is migrating outside the DSA. In the total population (including both residents and non-residents) in 2006, for every 100 people in the economically productive group there were 66 dependents. This is comparable to other rural areas in South Africa, and it closely reflects the dependency ratio of 65% for KwaZulu-Natal, and is marginally higher than the national level at 59%. However, as compared to lesser developed countries where dependency ratios are as high as 90%, while this community is predominantly rural, its population burden is relatively low (Muhwava & Nyirenda, 2008). Data collected through socio-economic surveys in the DSA suggest socio-economic improvements in this area between 2001 and 2006. The area has experienced a marked increase in the provision of electricity, water and sanitation in the past 5 years. Despite being a predominantly rural area, the principle source of income for most households is waged employment and state pensions rather than agriculture (Tanser et al., 2008).

In 2006, in most households, the head of household was resident (72%) and was male (64.8%), while 35.2% of households were female-headed. The average household size is seven members, which is considered very large and is almost double the average size (4.2) recorded for KwaZulu-Natal in the 2001 census. Household size is likely accounted for by the multi-generational nature of household composition as opposed to nuclear family households. Most households are headed by adults around the age of 50 years, and on average there are approximately 3 children aged 18 years or less in each household. Fertility rates in this

population are not high, with a total fertility rate (TFR) of less than 3, and fertility is on the decline (Moultrie & McGrath, 2007).

As in the rest of South Africa and KwaZulu-Natal, as shown by Hosegood, McGrath and Moultrie (2009), marriage rates in this population are low and that the proportion of the adults ever married has been declining annually since 2000. Although polygamous marriage is traditionally accepted in Zulu culture, the majority of marriages in the study area are reported to be monogamous, and as expected, polygamy is higher in older age groups. The low rates of marriage in this community are offset by high rates of non-marital regular partnerships. In 2006 over 60% of women aged 18-24 and 80% of women aged 25-29 reported being in a regular non marital partnership. Over the period 2000 to 2006, casual partnerships have declined while regular partnerships have steadily increased.

3.2.2.3 HIV prevalence and reproductive health in the research community

HIV has had a severe impact on this community. As shown in Figure 3-3 below, HIV prevalence among women aged 15 to 19 years is 9.9%. Among HIV negative women aged 15-19 adjusted HIV incidence rates are 4.7 per 100 person years (Barnighausen et al., 2008). HIV prevalence has continued to rise since the early 1990's, and by 2004 prevalence was 30.5% in women aged 20-24 years compared to 8.1% in men of the same age, highlighting the younger age of acquisition of HIV for females. At 25-29 years the prevalence amongst women was 50.9% and amongst men 30%, highlighting the dire need for prevention and treatment interventions in early parenthood in this population.

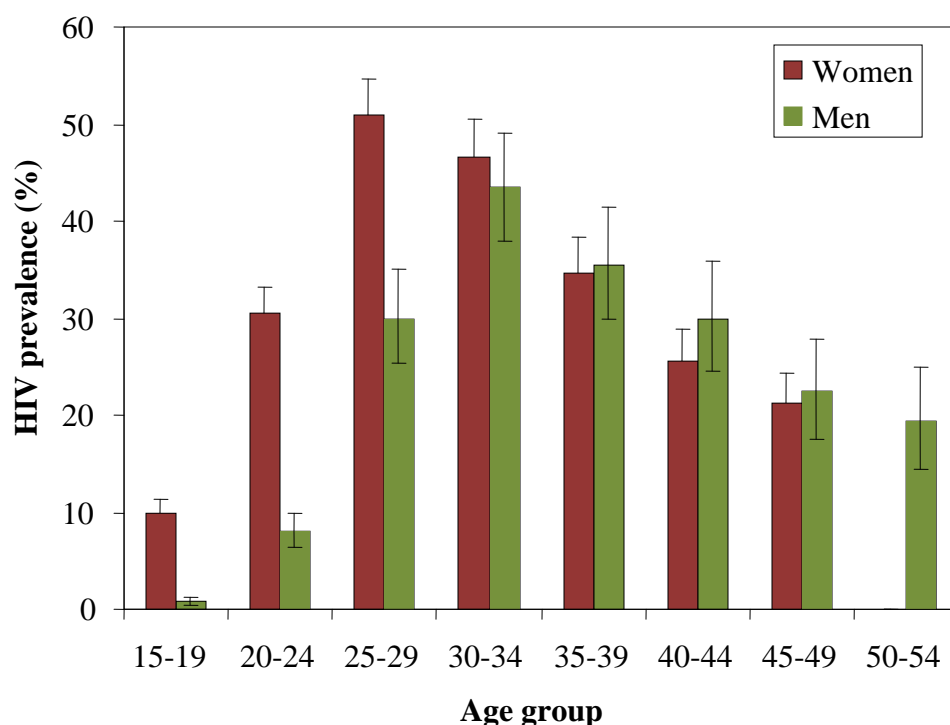


Figure 3-3 HIV sero-prevalence by age and sex (95% CI) among residents (2003-2004)

Sourced with permission: Tanser et al. (2007)

In McGrath, Nyirenda, Hosegood and Newell's, (2009) examination of a sub-sample of 12 to 25 year-olds reported to be virgins at the beginning of the surveillance period (including 4724 women and 4029 men based on data that was collected between 2003-2007), the median age at sexual debut was 18.5 for girls and 19.2 for boys. The risk factors associated with earlier sexual debut across gender were peri-urban residence versus rural; ever having used alcohol; and knowing at least one person who had HIV. School attendance had a significant protective effect on sexual debut. It is clear that HIV has had a severe impact on this community.

Contraception use among 15 to 24 year olds in this population indicates that 52% of those reporting ever having sex, reported condom use. Having an older partner decreased the likelihood of using a condom, while higher family social economic status increased the

likelihood of condom use. Being a female and having a regular partner were independently associated with low consistent condom use (Chimbindi, McGrath, Herbst, San Tint, & Newell, 2010). Evidence from a large vertical transmission study showed that hormonal injections were the most common contraception use in the first two years postpartum, and very few women used condoms as dual protection, although HIV positive women were more likely to use condoms in the first two years postnatal than HIV negative women (Ngubane et al., 2008). Among sexually active women not intending pregnancy and screening for a microbicide feasibility study, Subramanian, McGrath, Ndlovu, and Gafos (2008) found 466 (54%) reported currently using modern contraceptives: injectables (31%), condoms (12%), sterilization (6%) and pills (4%).

3.2.2.4 Health care provision and HIV treatment in the research community

In this population verbal autopsies in the year 2000 showed that 74% of deaths among women and 61% among men aged 15-44 years were due to HIV-related causes. The introduction of a comprehensive HIV treatment, care and support programme in 2004 has significantly reduced mortality in this population (Herbst et al., 2009). As at 2010 the HIV treatment programme had over 10,000 adults on treatment of which the large majority were women aged 26-45 years as illustrated by Figure 3-4 below.

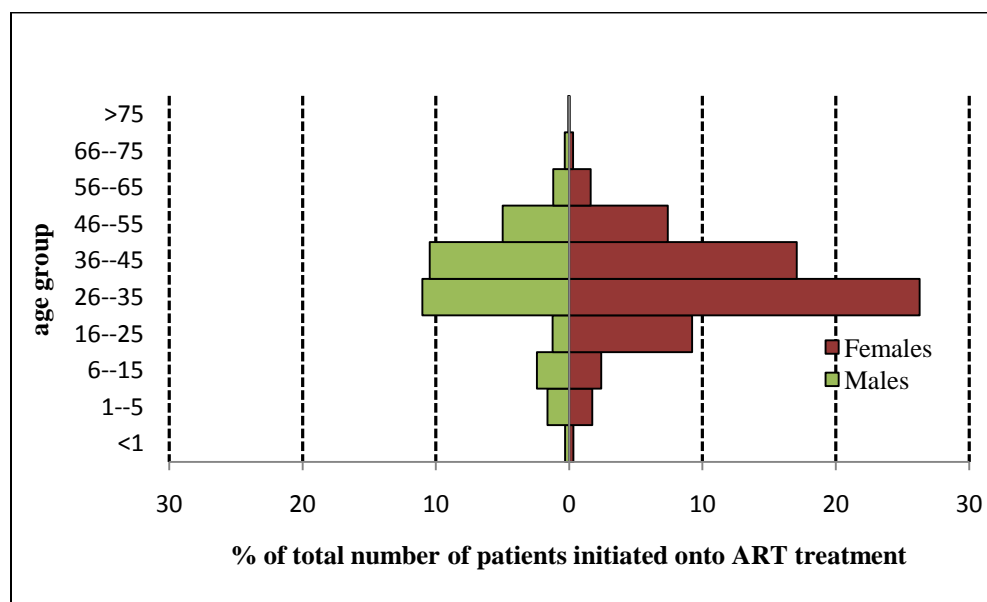


Figure 3-4 Patients initiated on ART by gender and age

Sourced with permission: Houlihan et al. (2009)

Hence, despite the high prevalence and incidence in this population, mortality has declined significantly from 22.52 to 17.58 per 1000 person-years in women 25-49 years of age and from 26.46 to 18.68 per 1000 person-years in men 25.49 years in the period 2004-2006 compared to the period before ART in 2002-2003(Houlihan et al., 2010).

Provision of HAART has also impacted on child mortality in this population in recent years. Mortality rates for the overall < 2's have more than halved in the period 2001-2007, while mortality rates in neonates have remained relatively constant; with most of the decline observed in the post-neonatal period (Ndirangu, Newell, Tanser, Herbst, & Bland, 2010). Children born within 2 years of HAART roll-out have been shown to have a 34% reduced likelihood of dying compared to those born before HAART became available. Those born two or more years after HAART roll out had a 55% reduced likelihood of dying. Children exposed to a single dose of Nevirapine only through PMTCT had a 15% reduced likelihood of death, holding all other factors constant. The reduction in child mortality was partly due to the roll-out of the PMTCT programme (and a reduction in the number of HIV infected children), but mostly due to the HIV treatment programme (which keeps mothers alive and thus all their infected and uninfected – children). The HIV treatment programme also has a large paediatric cohort, and by the end of 2007 approximately two thirds of the number of children predicted to need treatment had started ARV treatment.

The Hlabisa sub-district health services include one local district hospital (Hlabisa hospital) with 296 beds, one onsite hospital primary health care clinic, and 16 decentralised primary health care clinics in the surrounding community. The hospital and clinics service a population of approximately 220,000.

3.2.2.5 Baseline results: Antenatal depression in the research community

This research was preceded by a baseline study (Rochat, et al., 2006). The aim of the baseline was to examine the rates of depression amongst women presenting for antenatal care prior to being tested for HIV, and their perceptions regarding the consequences of an HIV positive diagnosis.

The baseline study (Rochat et al., 2006) was a cross-sectional study undertaken at antenatal clinics in three rural primary health care facilities within the demographic surveillance

area of the Africa Centre. A consecutive series of 242 women presenting for antenatal care, and testing for HIV during the second half of pregnancy in a high HIV prevalence area, were recruited. To be eligible, women were required to be testing for HIV for the first time in the current pregnancy and to not have previously tested HIV positive if tested prior to this pregnancy. In addition, women were required to be at least 16 years of age, in the second half of pregnancy, and to live in the study area. Of women approached, 82.3% were enrolled. Reasons for non-participation included insufficient time, non-return after requesting opportunity to discuss with family, and unwillingness to participate in research. Informed consent was obtained in writing and the study received ethical approval from the Biomedical Ethics Review Board of the University of KwaZulu-Natal and the Oxford Tropical Research Ethics Committee (OXTREC).

The main outcome measure was the EPDS (Cox, Holden, & Sagovsky, 1987) and a questionnaire concerning women's perceptions of the consequences of an HIV positive diagnosis. This 9-item questionnaire based on previous work (Lester, et al., 1995) was designed to elicit women's perceptions of the consequences of an HIV diagnosis in three domains: access to health care, financial and social support. Each domain was made up of three items related to that specific domain. Domains were scored as the sum of the item responses in each domain. Data on the HIV status of the women's partners as well as socio-demographic information were also collected. After participation in the study, participants went on to test for HIV as part of the PMTCT program at the clinics.

The mean age of the sample was 24.8 years (SD 5.9, range 16 to 44). Half the women (51.7%) had completed some secondary education while a third (32.8%) had completed secondary education. The majority of women were unmarried (87.5%), living in a family homestead (79.7%), and approximately one third had at least one previous child (35.1%) with the current partner. Most women reported that the current pregnancy was unplanned (83.6%), and most indicated they were still in a relationship with the father of the child (96.1%). Mothers did not yet know their HIV status at the time of completing the depression assessment. HIV test results subsequently revealed that 41% (n=99) of the sample were HIV positive. While 76.9% of the women did not know their partner's HIV status, most believed he would *definitely* (44.6%) or *perhaps* (34.6%) agree to be tested.

The results found an EPDS score consistent with depression was found in 99 of 242 women (41%) with 45 of 241 (19%) reporting thoughts of self-harm within the last 2 weeks. The factors significantly and independently associated with increased depression scores included an unplanned current pregnancy and absence of a regular household income. In the perception questionnaire, the only domain significantly associated with increased depression scores was concerns about access to health care. Of the 9 specific items, only the perception of discrimination in access to health care and reduced access to household financial resources following an HIV diagnosis were significantly associated with depression at the .025 level. Depression and HIV status were not significantly associated. Women who were depressed were more likely to perceive that testing HIV positive would increase discrimination in access to health care and would reduce their access to household financial support. Depression is high in this community and may affect women's perceptions and uptake of health care services.

3.3 Part 2: Research design, study preparation and procedure

This section of the chapter begins with an overview of the research design and describes the doctoral study and its relationship to the baseline study. This is followed by a description of the steps taken in preparation of the study, including a detailed description of steps taken during translation and piloting to ensure cultural sensitivity. The section ends with an outline of the study procedures and ethical considerations.

3.3.1 Research design

This study was designed to examine antenatal depression among pregnant women testing for HIV in a rural community in South Africa. This study formed part of a larger programme of work examining antenatal and postnatal depression in a rural community with high HIV prevalence. This research is a nested study and additionally involved an in-depth assessment of a smaller sub-sample of the cohort of baseline participants, several weeks after the baseline assessment and post routine HIV-testing as part of the (PMTCT). The scope of this thesis is limited to the second assessment data only. As such, baseline data is not included or examined longitudinally as part of this doctoral thesis.

To help orient the reader, a diagrammatic summary of the research design is presented below. Figure 3-5 provides an overview of both the baseline and doctoral studies and illustrates the two (quantitative and qualitative) components of the doctoral research. The quantitative assessment method combined a well validated screening tool with a rigorous clinical assessment of depression. In turn, this quantitative data was complimented by the collection of qualitative data through in-depth interviewing a sub-sample of women. In what follows, this diagram will be explained in more detail.

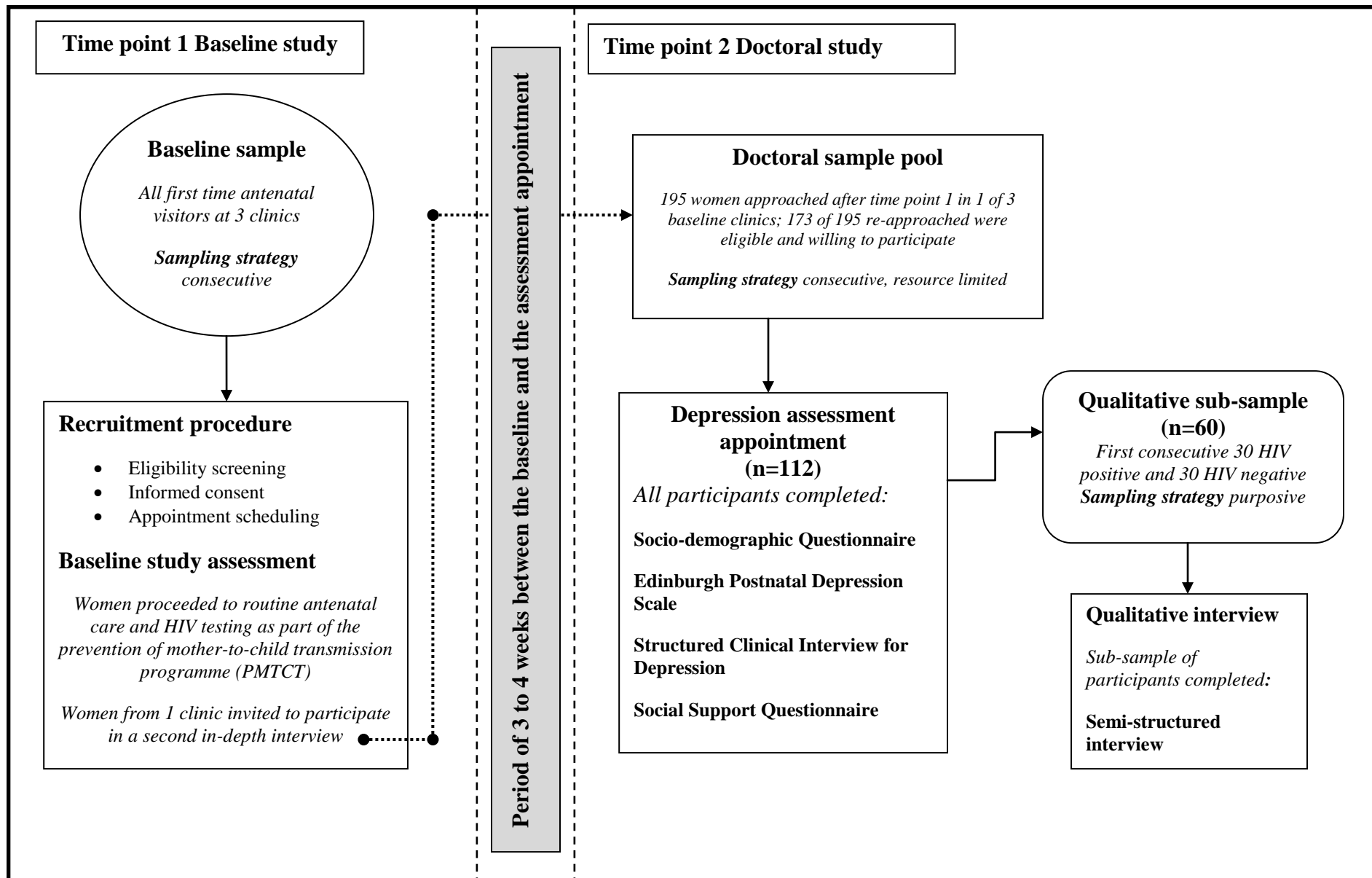


Figure 3-5 Overview of research design

The second assessment followed the baseline, and included a more comprehensive assessment using a gold standard measure to provide a reasonable and reliable estimate of antenatal depression prevalence. Sample size was calculated prior to the baseline study which enrolled 242 women from three clinics. Power calculations determined that a sample size of 250 would provide 80% power to detect an odds ratio of 2.0 with 2-sided $P < .05$. Due to the rapid rate of enrolment at all three clinics during the baseline, and the vast geographical distances between the three clinics (>50 and 80km each) it was only possible to complete the second in-depth assessment at one of the three clinics, given the available window period of 4 to 5 weeks before women delivered their babies.

Baseline assessment of 242 women at all three clinics had proved feasible because the average baseline assessment took only 10-15 minutes, while the planned second assessment required 1-2 hours, making it unfeasible to get to all three recruitment sites to assess all women, prior to their expected delivery. Given these parameters, and the spread of women at the three clinics (Clinic 1 n=195; Clinic 2 n= 30; Clinic 3 n=17), undertaking the second measurement process at all three clinics was judged to be expensive and time-consuming, with little relative gain. Continuing assessment at all three clinics would likely result in larger numbers of women being excluded because they delivered prior to assessment, and larger loss to follow-up at the highest recruiting site of the three sites.

As a result, one clinic site was selected which had recruited the majority of women in the baseline (195/242 or 80%); this clinic presented the best feasible option to maximize sample size and complete a nested study. Following statistical advice, a theoretical optimal precision level (0.10 or 10%) was considered to be an adequate statistical approach, despite the reduced sample size.

The clinic retained in the doctoral research study had recruited the majority of women in the baseline and was the largest clinic in terms of size, patient flow and diversity of services. This sample of 195 women were requested to participate in a second in-depth assessment interview which took place 3 to 4 weeks after women had participated in the baseline study and had tested for and received their HIV results. The doctoral research was cross-sectional and descriptive. Consecutive sampling was used for this smaller sub-sample and both HIV positive and HIV negative women were included. The expected antenatal HIV prevalence in the study

area was 37.7% (Rice et al., 2007), and thus, using consecutive sampling techniques an expected ratio of approximately 35-40 HIV positive women to 60-65 HIV negative women per 100 women was expected.

In the development of the research design, three specific decisions regarding data collection and data analysis were made, as suggested by Punch (2005).

- Firstly, methods were not taken as equal in that the gold standard is taken as the measure of highest order and considered definitive in the determination of depression. Qualitative and scale data collection tools are secondary data collection tools that add to or inform the interpretation of the gold standard data.
- Secondly, the data collection tools did not influence each other; each data collection tool was implemented independently. Data was collected and analysed apart from one another; each data set addressed differing components of this research question. Data was only combined at the point of interpretation.
- Thirdly, the measures are not conducted simultaneously, but rather sequentially beginning with social demographic and social support data collection, followed by depression measures and ending with qualitative interviewing. The sequencing of data is purposeful and intended to move from structured quantitative data collection at the beginning of the assessment to semi-structured open-ended qualitative data collection towards the end of the assessment, when greater rapport had been established.

In several instances in this research, qualitative method was linked to and followed after quantitative method in order to flesh out quantitative findings (Clarke, 2003). Thus, the qualitative component is an adjunct to the quantitative, improving its depth or quality rather than making an equal contribution to knowledge about the phenomenon (Greene, et al., 2001).

The design allowed for the examination of the rates of depression using a gold standard assessment while the qualitative interviews provided insight into women's personal experiences of pregnancy and testing for HIV. Qualitative interviews were limited to the first 30 consecutive HIV positive and first 30 consecutive HIV negative women presenting for assessment interviews, based on the assumption that this would provide a sufficient qualitative sample size to reach saturation, using examples from other health care research (Mays & Pope, 2000; Pope, Ziebland, & Mays, 2000).

The two phases of interviewing in the doctoral study are outlined in Figure 3-6.

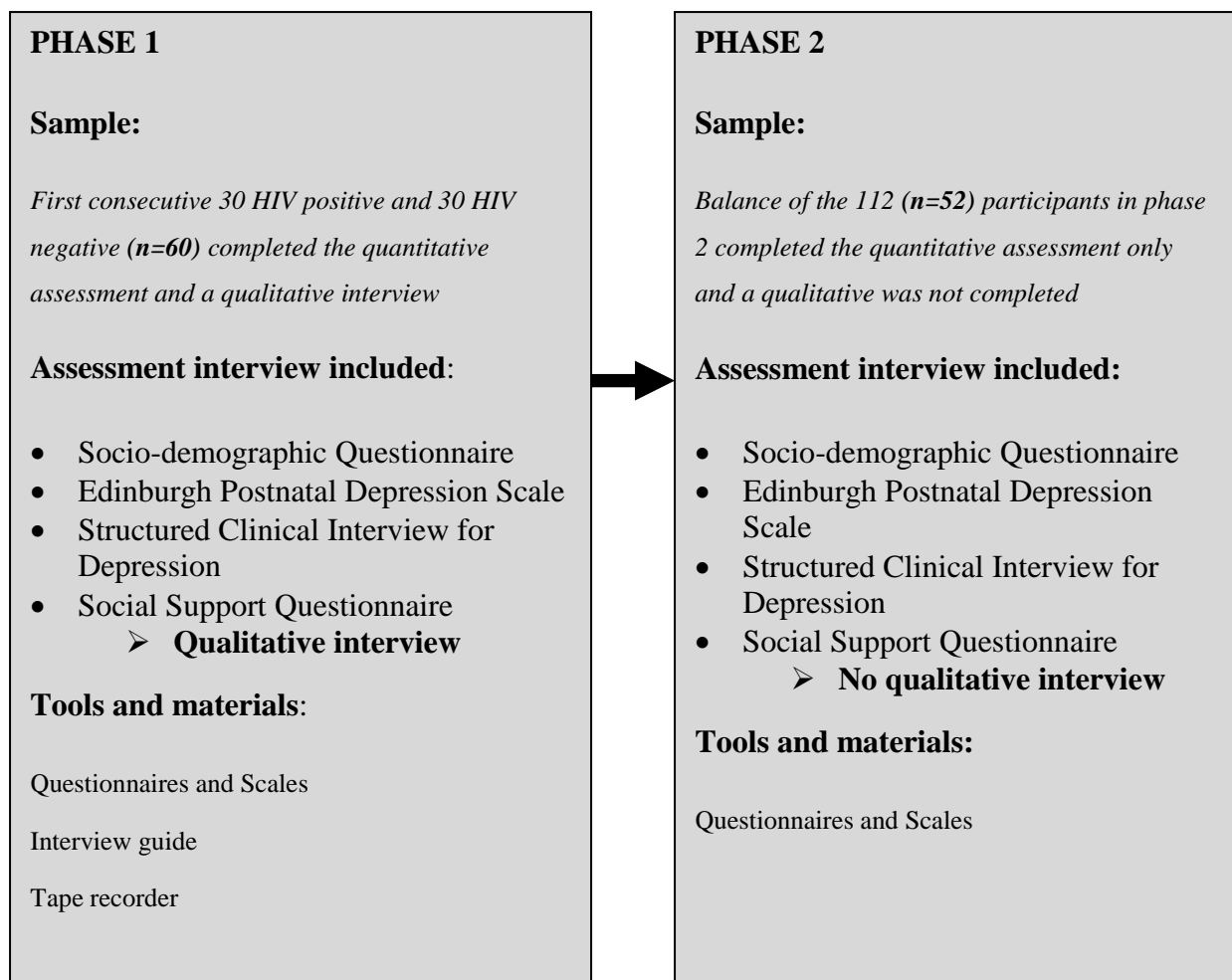


Figure 3-6 Two phases of assessment

3.3.2 Study preparation

Given the emphasis placed on cultural sensitivity and validity in the assessment of antenatal depression, several steps were undertaken during the study preparation stage to ensure the cross cultural validity of depression assessments in the study community.

3.3.2.1 Translation and adaptation of measures

Given Prince's (2008) cautions of how cultural differences in norms, or expectations, or expressions of mental distress can influence the validity and reliability of a psychological measure in the cross-cultural setting, careful translation-back translation and adaptation protocols were followed. The translation and adaptation of measures followed the guidelines outlined by Sperber, Devellis and Boehlecke (1994) and the more recent detailed recommendations of Weeks, Swerissen and Belfrage (2007) for dealing with challenges in cross-cultural translation in a four country study. These include ensuring careful one-way and back-translations, making use of bilingual techniques, implementing a committee approach in the final fine tuning of the measure, and finally, undertaking careful pretesting using repeat measures with the same participants to resolve discrepancies.

The first phase of translation and adaption of measures entailed a one day workshop. The focus of this workshop was to interrogate established psychological constructs involved in the diagnosis of depression (according to the DSM-IV-TR) and the meaning of these psychological constructs, signs and symptoms in the Zulu cultural context. The goal of the workshop was to identify Zulu terminology, commonly shared and agreed upon by several workshop participants, which could accurately be used to describe these various aspects of depressive signs and symptoms when making a diagnosis of depression in local Zulu communities.

The workshop was facilitated by myself; I am an English speaking clinical psychologist with several years' clinical work experience in the Hlabisa sub-district, and have rudimentary Zulu language competency. The two Zulu-speaking research assistants, along with two independently contracted first language Zulu-speaking clinical psychologists residing and working in public health services in the greater Durban area, and a Zulu speaking psychiatric nurse from Hlabisa hospital with 18 years experience in both mental health, outpatient and midwifery services, attended the workshop.

The output of the workshop was a list of common Zulu descriptions which could be used to describe the various signs and symptoms of depression, which were then used to guide the translation and adaptation of the measures to be used in the study. At this workshop it was established that a specific IsiZulu word 'Ingcindezi' is commonly used to describe 'depression' in this population. The translation of this word means 'for something to be pressing down on you or weighing down on you and your emotions'. Common manifestations include a 'heaviness of heart' and general understandings in the Zulu community are that 'Ingcindezi' can lead to other problems, ranging from a lack of motivation to do anything, to more serious problems such as wishing to end your life or no longer wanting to live (suicide). It is believed that 'Ingcindezi' should be treated with 'support' and 'kindness' by family and friends and that health care providers (nurses and doctors) can provide counselling and advice, and in severe cases medication if the person does not improve over time.

Using the data from the workshop, the Zulu-speaking clinical psychologist who attended the workshop was contracted to translate the EPDS and the Structured Clinical Interview for Depression Questionnaire (SCID) into Zulu. A Zulu-speaking language student was approached to complete a blind back translation of the depression measures into English. After review, discussion and adaption to ensure congruency in meaning with the original measure, the translated version was again back translated by a second Zulu-speaking graduate student. Following this process, the research team were satisfied that the translated versions of the measures accurately represented the psychological constructs they were intended to measure.

The other questionnaires used in the study (the socio-demographic form and adapted social support questionnaire) did not involve complex psychological or social concepts and were not subjected to this workshop process. However, they were translated and back translated by the Zulu-speaking research assistants and checked for accuracy by a Zulu-speaking social worker employed by the Africa Centre.

3.3.2.2 Training of study staff

Following the successful translation of the instruments, a training programme was undertaken with the research assistants who would be responsible for completing the data collection. A model training programme on culturally sensitive training in the field of psychiatry,

developed by LoboPrabhu, King, Albucher and Liberzon (2000) was used as a guide in development of the training programme. A three day training workshop, which included competency-based and role play exercises, was facilitated by myself. This workshop covered basic aspects of psychological models of depression and the definitions and diagnosis of depression in general and of antenatal and postnatal depression in particular. A significant focus of the training was on developing interview skills to attend to cultural sensitivity and to probe for aspects of diagnostic criteria, including signs and symptoms of depression, duration of symptom presentation and loss of function or degree of impairment.

Following this, the two research assistants and I travelled to Cape Town to attend a two day training and practice session hosted by Professor Mark Tomlinson who was also at the time a co-investigator on a large clinical trial on postnatal depression in Cape Town (Cooper et al., 2009). This training session involved inter-rater reliability training and assessment using videotaped interviews of mothers participating in the Cape Town trial.

3.3.2.3 Piloting and pretesting

For the purposes of piloting, twelve women were recruited from the maternity ward of Hlabisa hospital. All twelve women were in their third trimester of pregnancy and were awaiting delivery as in-patients. The two research assistants then completed depression assessments with six of the twelve women over a two day period. Thereafter, the two groups of participants were alternated/rotated and given a repeat assessment interview by each interviewer. A total of 12 assessments were completed by each interviewer, and each of the two groups of six women was assessed twice, once by each interviewer. Following this, a focus group was facilitated by a Zulu-speaking psychiatric nurse with each group of six women.

The purpose of this piloting exercise was three fold:

- To allow each research assistant twelve learning opportunities to practice the full assessment battery, and to monitor through observation and supervision, aspects such as mastery of interview skills for all assessment items, probing skills and the time it took to deliver the assessment battery.
- To test inter-rater reliability between each of the two research assistants. Depression outcomes were compared across the two interviewers for each of the 12 women to assess

whether the interviewers had rated women reporting symptoms equally. To facilitate this, the participating women were requested to keep their responses to rating scale and interview items as congruent as possible across their two interviews, and not to offer more information than was directly asked or probed for, by any one research assistant. This data was also used to test comparability in probing skills based on the depth of data gathered by each research assistant during interviews.

- To use the focus group to get feedback of participating women's experiences of the research assistants as interviewers, to identify areas where women felt questions and items were unclear or confusing or repetitive, and to explore other aspects of the assessment in terms of acceptability and timing.

This pilot illustrated that inter-rater reliability of depression signs and symptoms as measured by the EPDS and the structured interview was good, with 11/12 receiving the same diagnostic outcome on both depression measures, regardless of interviewer; in 1/12 cases interviewers recorded frequency and duration information differently for the sleep and appetite as symptoms, and further training and clarification was provided.

The focus group data also provided confirmation of the psychological constructs and terminology developed during the workshop process. In particular, focus groups suggested that the term 'Ingcindezi' was well understood, and that among pregnant women common understandings of this word included 'feeling constantly worried or sad in a way that you could not get out from under the feeling' and 'feeling not happy all the time and not being able to shake the unhappiness'.

3.3.2.4 Preparation of the health care environment

Prior to the start of the research, steps were taken to ensure that the health care environment was adequately prepared for the study. This included gaining agreement on how the research process could be facilitated within the routine antenatal care services with minimal disruption. Two rooms were allocated within the Africa Centre facilities at the clinic for assessment interviews, which were in close proximity to antenatal services, but were also adequately separate and private. As a service to the clinic and to help with research staff integration, research assistants agreed to assist health care staff with daily preparation for the

antenatal clinic services, including the registration of antenatal patients and other routine tasks which could be completed before their first scheduled appointments of each day.

The two research assistants spent a week undertaking observations at the clinic to observe the flow of antenatal patients, the daily schedule of activities, and familiarised themselves with the clinic staff, routines and referral sources. A system for processing participant reimbursements and refreshments was also developed, and technical checks run on tape recording equipment.

3.3.3 Study procedure

As indicated, the women participating in this research were recruited from the cohort of women who had participated in the baseline study at one of the three baseline clinics. The recruitment procedure for both the baseline and the doctoral study were interrelated. Participants at KwaMsane clinic were asked to give written consent at baseline recruitment to participate in a second in-depth assessment interview three to four weeks after completing the baseline screening interview.

3.3.3.1 The recruitment site - KwaMsane clinic

This research was undertaken at the largest peri-urban clinic in the sub-district, KwaMsane clinic. KwaMsane clinic is located in the peri-urban KwaMsane Township close to the national road. KwaMsane Township is an area with very high prevalence of HIV as compared to other areas in the DSA. Located on the furthest side of the district to the hospital, this clinic often acts as a triage centre for the hospital, in particular for patients residing on the eastern side of the Hluhluwe/Umflozi reserve.

The clinic is staffed by 20-30 nurses and offers the full range of primary health care services to over 10,000 patients per month, including a large antenatal and postnatal outpatient service with an average of 160 first time antenatal attendees per month. It is the only clinic in the sub-district which offers a 24 hour health service and manages normal deliveries, with between 70-100 deliveries per month. The clinic is visited by a general physician once per week, an ART physician once per week, and a specialist paediatrician runs a family clinic, with assistance of a medical officer, once per week. At the time this research was conducted in 2005, while there was a PMTCT programme running at KwaMsane clinic, ART services were limited. After the

national roll-out in 2004, ART services were only available from the hospital. Later in 2004 and early 2005 services were expanded to include KwaMsane, which has since expanded into the largest ART clinic in the district. By late 2006, six other clinics were offering ART initiation; by late 2007, all 17 clinics offered ART initiation and follow-up.

3.3.3.2 Recruitment Procedure

All first time antenatal attendees at KwaMsane clinic at the time of this study followed a set protocol for their first antenatal visit, which included the PMTCT. Women received mandatory group information sessions by nursing and counselling staff on general pregnancy health and HIV. Following these routine group information sessions, all antenatal attendees were required to attend a mandatory one-on-one HIV pre-test counselling session with a PMTCT counsellor. Once pre-test counselling was completed, women could either test for HIV or opt out of HIV testing.

Women were given information about participating in this study during routine group information sessions. If women were interested in participating in the study, they completed informed consent and a brief baseline screening prior to proceeding to one-on-one HIV pre-test counselling with the PMTCT counsellor. The recruitment procedure was structured in this way to make maximum use of the participant's available time, without disruption of health care services, by recruiting and completing screening with women while they were waiting in the queue for their mandatory counselling session with one of three PMTCT counsellors. Arrangements were put in place to ensure that women could leave the queue in order to complete the research process in a private room and then return to the queue once completed without penalty or loss of her place in the queue.

After enrolment, women could opt out of testing or receiving their HIV results on the understanding that they would be withdrawn or excluded from the second assessment. Women were eligible to participate in the second assessment based on the following inclusion and exclusion criteria:

Inclusion criteria

- Residing in the study area and planning to remain in the study area for the duration of the pregnancy;

- At least 16 years or older;
- Attending their first antenatal session in this pregnancy and testing for HIV as part of PMTCT, and willingness to receive their HIV results;
- Having sufficient capacity to consent.

Exclusion criteria

- Not currently residing in the study area or planning to migrate out the study area during the course of the pregnancy;
- Not meeting the minimum age requirement of 16 years to consent to participate;
- Not willing to test for HIV as part of PMTCT, or not being willing to receive their HIV results;
- Already aware on their HIV positive status prior to this pregnancy, or receiving HAART treatment;
- Not having sufficient capacity to consent.

As noted above, three groups of women were purposefully excluded:

Firstly, women who were already aware of their HIV positive status prior to this pregnancy were excluded because they had chosen to become pregnant knowing their HIV status, and so, were considered different from the norm of women who were testing for HIV for the first time during their pregnancy.

Secondly, given the low treatment availability at the time of the study, women already on HAART treatment were considered different from the norm - as likely to be either particularly ill or particularly well-resourced compared to the general group of women recruited for this study by virtue of significant barriers in treatment access.

Thirdly, women under the age of sixteen were excluded as enrolment of these women was prohibited ethically (unless parent consent could be gained, which significantly complicated the design) but also because younger adolescent girls may have a higher prevalence of depression; a different set of risk factors and different experiences of pregnancy.

A reimbursement was not offered for participation in the baseline assessment since it was undertaken as part of a routine health care visit.

3.3.3.3 Ethical clearance and considerations

The study was granted ethical clearance by the Biomedical Ethics Committee of the University of KwaZulu-Natal E193/3 and by the Oxford Tropical Research Ethics Committee (OXTREC 014-04). Permission was granted for this study to take place in a Department of Health facility by the local Hlabisa sub-district health authorities and the uMkhanyakude health district management in Jozini as per Department of Health protocol.

According to the guidelines of the biomedical ethics committee of the University of KwaZulu-Natal, participants were reimbursed for transport costs given that the interview assessment took place at a time other than a regular scheduled health appointment. The rate of reimbursement of R80 per participant was determined by the Community Advisory Board of the Africa Centre based on local transport costs. Likewise, refreshments including a sandwich, fruit and juice were provided to each participant on the day of the assessment interview, and were sourced from local community service providers.

At the time of enrolment into the baseline study, these participants were asked to sign consent to participate and consent to be contacted. Participants approached for the baseline study at KwaMsane Clinic were also re-approached and asked to consent to participate in this second more detailed assessment. In line with the ethics committee recommendations, limits were set with regard to contacting of participants towards completion of this second assessment. If women had consented to participate in the second assessment, and consented to be contacted with regards to the second assessment, but did not arrive for their scheduled appointment, they could be contacted a maximum of three times before they were considered to be lost to follow-up or withdrawn; any further attempts to contact them would be considered harassment by ethical guidelines.

In line with ethics requirements, a referral protocol was developed to respond to cases of moderate to severe depression identified through the research. All women at moderate risk were referred to the clinic counsellor, primary health care nurse and medical officer at the clinic for assessment as appropriate. Women with moderate to severe risk of depression and suicide ideation were referred to the clinical psychologist at Hlabisa hospital. Women who were actively

suicidal and could not be referred into family care were admitted into Hlabisa hospital under the management of the Clinical Psychologist.

Given that this research was conducted in a setting where women may be made vulnerable by stigma, ethical concerns were raised regarding the management of information related to HIV status. As a result, research assistants were blinded to HIV status of participants at the time of the depression assessment. The HIV status of participants was collected via the PMTCT code which allowed the doctoral student to verify HIV status independently via clinic records, using the PMTCT code and the South African identity number of participants.

3.4 Part 3: Data collection and data analysis

This section of the chapter describes each of the quantitative and qualitative measures, before outlining the data preparation and data analysis steps for each measure.

3.4.1 Data collection

The diagram in Figure 3-7 overleaf outlines each of the research measures, their placement and timing in the overall assessment interview design, their structure and content, and the research questions they were intended to address. All questionnaires and the semi-structured interview guide are included as appendices, labelled Appendix A through Appendix E.

3.4.1.1 Quantitative Measures

Data collection included four quantitative measures collected using questionnaires which were administered in an interview format by research assistants.

Socio-demographic questionnaire

The socio-demographic questionnaire (refer to Appendix A) included data on basic socio-demographics; pregnancy history, including gestation; information on risk factors commonly identified in the literature, such as whether the pregnancy was planned or unplanned, age, education, marital and relationship status, socio-economic status, child care responsibilities, instrumental social support, and living circumstances. Some specific definitions were formulated for use in the socio-demographic questionnaire, and are outlined below.

For the purposes of this research, planned versus unplanned pregnancy was defined as follows: the pregnancy was considered “planned” if the participant stated that she intended or planned either on her own or with her partner to have a child, or if she had discussed having children or planning a pregnancy with her partner before falling pregnant. The pregnancy was considered “unplanned” if she did not intend or plan on her own or with her partner to have a child, and did not discuss having a child or planning a pregnancy with her partner before falling pregnant.

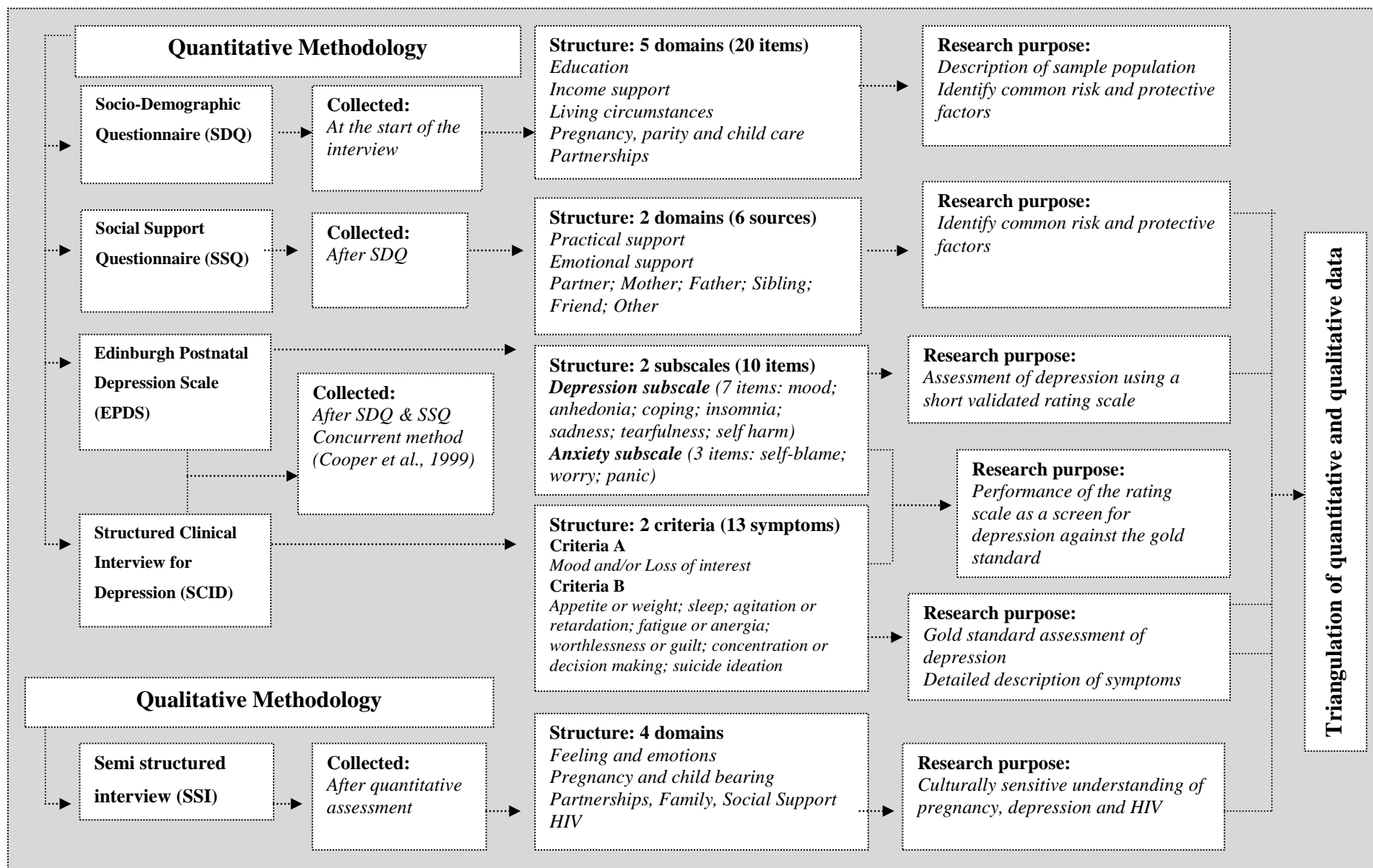


Figure 3-7 Overview of research measures

The known population dynamics of this study community suggested that marriage rates were likely to be low and that stable partnerships (which include childbearing) were common. Standardised questions on regular partnerships and marital status were expanded to include these aspects of relationship status. Questions examined whether the women were in a current relationship with the partner, the status of that relationship, and whether the women had other children by this partner. Women who were not married but in a relationship with a stable partner were recorded as “not married” rather than “single”.

Living arrangements explored whether women were cohabiting with their partner and whether they cohabited at her or her partner’s family homestead. If women were not cohabiting, it explored whether the women were living on their own or in a family homestead. Given social and cultural norms already documented in Africa Centre research, it was established that unless formally married, it could be expected that women would still be living in a parental home, and this was defined as a family homestead. Women who were renting or living on their own with a partner away from either of their families of origin were defined as living in a non-family homestead.

Social support questionnaire (SSQ)

Practical and emotional support was assessed using an adapted shortened version of the Social Support Questionnaire (Sarason, Sarason, Shearin, & Pierce, 1987) shown in Appendix B. Two items were included, one to examine emotional support and the presence of a confidante: “Can you share your feelings openly with (insert index person)?” and the other to examine practical support “Does (index person) give you practical help?” Each of these two items were repeated for a number of index persons considered possible sources of social support, including husband or partner, mother, father, sibling, best friend or other significant persons, which could include health care workers. This adapted short version has been used in similar work in South Africa (Cooper, et al., 1999).

The measure enquired about each of the five sources of support, in the first instance with a filter question to establish the presence or absence of the index source of support, and thereafter, administering each of the two items and recording responses on a Likert items of ‘never = 0’ ‘sometimes = 1’ and ‘always = 2’. A minimum and maximum subscale in the range of

0-4 was established for each of the five index sources of support, and an overall scoring range of 0-20 across sources of support.

Edinburgh postnatal depression scale (EPDS)

The EPDS (refer to Appendix C) is by far the most widely used self-report instrument in antenatal and postnatal depression studies and for population-based screening (Dennis, 2003). The EPDS is a 10-item self-report scale specifically designed to screen for postnatal depression in community samples (Cox, Holden, & Sagovsky, 1987). Each item is scored on a 4-point scale (from 0 - 3), with a total score ranging from 0 to 30. Seven of the ten items (items 3, 5-10) are reverse scored.

The items include questions related to maternal feelings during the past 7 days and refer to depressed mood, anhedonia, guilt, anxiety, and suicidal ideation. The EPDS is typically administered as a pencil and paper test, and is highly acceptable to women. The questions in the EPDS focus on the psychological rather than the somatic aspects of depression. The questions explore 2 distinct domains of negative affect: depressive symptoms (7 items) and anxiety (3 items) (Wisner, Parry, & Piontek, 2002).

The original EPDS study was completed with a sample of 84 Edinburgh women identified by health professionals as potentially depressed at 6 weeks postnatal. A threshold of 13 identified all women with a diagnosis of major depression with a sensitivity of 86%; specificity of 78%, and positive predictive value of 73%. As such, a cut-off score of 12/13 has been recommended for major postpartum depression symptomatology (Cox, et al., 1987; Dennis, 2003). However, the EPDS does not provide a measure of severity as women who score over 18 can meet DSM criteria for minor depression while others scoring between 14 to 16 can be classified as experiencing major depression (Holden, 1994). Accordingly, the EPDS is not a substitute for a full clinical evaluation, but rather, a score above the cut off is indicative that further assessment is warranted. It is important to note that the selection of a cut-off score depends upon the assessment purpose. While a 12/13 cut-off is suggestive of major depressive symptomatology, a lower threshold of 9/10 has been recommended for community screening to ensure all potential cases of postpartum depression are identified (Cox, et al., 1993). In a community-based sample of over 14,000 women in the United Kingdom, Evans and colleagues

(2001) demonstrated the EPDS had sensitivity of over 80%, and specificity greater than 77%, with a recommended cut off of ≥ 13 being most indicative of major depression. Likewise, Heron et al., (2004) have validated the EPDS for use both in antenatal and postnatal period.

Halbreich & Karkun (2006), in a cross-cultural review of studies on the prevalence of postpartum depression, found the EPDS to be the most widely used and well validated screening measure for antenatal and postnatal depression in both developed and developing country contexts. The EPDS has been widely used in central and sub-Saharan Africa including in Ethiopia (Hanlon et al., 2008) Zimbabwe (Chibanda et al., 2010a) and Malawi (Stewart et al., 2009). The EPDS has been validated in South Africa by Lawrie et al. (1998) and more recently de Bruin, Swartz, Tomlinson, Cooper and Molteno (2004) examined the factor structure of the EPDS in a sample of South African women, and found a single factor structure, which is consistent with the theory on which the EPDS was based. The internal consistency of the EPDS measure was found to be satisfactory ($\alpha = 0.89$).

Structured clinical interview for depression (SCID)

The Structured Clinical Interview for Depression (SCID-research version) is widely considered the gold standard in depression assessment, and is commonly used in epidemiological studies on maternal depression (refer to Appendix D) (Heron, et al., 2004). The SCID has also been adapted and validated for use during pregnancy and postpartum, at 10 sites across 8 countries with diverse cultures (Gorman et al., 2004).

In South Africa, Cooper et al. (1999) used the SCID among pregnant and postnatal women as part of a baseline study preceding a clinical trial for postnatal depression. In the present study the same data collection method was used. The major depression section of the SCID questionnaire was extracted and questions were adjusted to reflect the antenatal period. The EPDS items were then incorporated into a SCID questionnaire template to increase ease of data collection. This template interview guide was then used to conduct the clinical interview. The questionnaire template was designed to cover all 13 possible symptoms of depression and to provide the research assistants with the ‘structure’ of the interview, as well as appropriate probes for specific symptom presentation, and techniques for the assessment of both duration and

severity of symptoms. The SCID interview guide included questions on duration of current episode and symptoms, and asked about previous episodes of depression.

In this study, the structured interview was conducted in Zulu, and responses were translated by the research assistants so that the interview response notes were recorded on the SCID interview guide in English. In line with questionnaire design, all responses to individual symptoms were filtered by an initial response of present (yes) or absent (no). When a symptom was recorded as present (yes), further filter questions were asked and comprehensive notes were recorded to capture the details of the symptom description in the participants' own words. Research assistants were encouraged to capture exact, accurate translations at all times. When a symptom was recorded as present (yes), further probing questions included items regarding whether the symptom was current, and the duration and the severity of the symptom. Data was recorded in its raw form by research assistants and no coding or scoring took place during the interview. However, in line with ethical considerations for referral of all moderate to high risk participants, if a participant reported yes to four or more symptoms or under any circumstances reported suicide ideation, an immediate referral was made to a health professional at the end of the interview. Data was coded by a clinical psychologist after the interview was completed.

3.4.1.2 Qualitative Interview

The purpose of the qualitative data collection was to explore contextual frameworks for understanding pregnancy and testing for HIV, and the social and cultural context within which depression manifests. Subjective experience of such pivotal health events are best captured through qualitative method which elicits and systematically analyses women's stories about what happened to them and how they feel about it (Stevens & Doerr, 1997). The purpose of a qualitative narrative approach is to capture women's reactions and perceptions, and to explore women's experience as embedded in the context of their lives, presented in the narratives they offer about their lives (Stevens, 1993).

Polkinghorne (1995) identified two types of narrative enquiry, firstly the *analysis of narratives* and secondly *narrative analysis*. Although both share the principle of working with stories as data, they have significant differences. Studies which use *analysis of narratives* use

data which consists of stories, and analyses them in order to produce typologies or categories across a group of stories as an analytical output. Conversely, studies which use *narrative analysis* use data which consists of actions, events, happenings and uses the analytic process to weave together a singular or multiple stories as an analytical output (Polkinghorne, 1995).

An *analysis of narratives* approach is taken in this research, whereby a constellation of stories are elicited within two delimited topic areas, and then analysed for shared meaning within and across groups. The *analysis of narratives* approach was partly selected because the time constraints of the assessment interview session did not allow for an entirely open-ended approach (as befits traditional narrative methods), and because the qualitative data was intended to supplement and inform the quantitative data. Instead, a semi-structured interview guide was used to elicit women's stories on two topics.

Appendix E shows the interview guide. In each interview women were asked to describe first the story of her pregnancy, and then to story of testing for HIV and learning her HIV status in the context of her pregnancy. This approach is an adaptation of an interview method used by Stevens and Tighe Doerr (1997), which explores a complex dialectical and contextual understanding of the social and cultural environment within which pregnancy and other health events such as HIV testing and depression occurs. All interviews were tape recorded and audiotapes were transcribed verbatim. Based on a reasonable expectation of saturation, and given time and resource constraints, the first 30 HIV positive and first 30 HIV negative women were included in the qualitative interviews.

Sampling used a consecutive series approach to avoid unnecessary bias, while filtering to ensure that equal numbers of HIV positive and HIV negative women were included. Since research assistants were blind to HIV status, women were given the option to say that they were not comfortable discussing HIV with the research assistant. While interviewers were blind to depression status at the time of the interview, if a woman expressed that she was experiencing emotional difficulties related to the pregnancy, further enquiry was made as to what she perceived subjectively was 'causing' these feelings.

3.4.1.3 *Quality assurance*

The data management protocol ensured that all required data was collected from participants at each assessment interview in a consistent and accurate manner. Several steps were undertaken to ensure the quality of the data collected, the rigour of data preparation and the accuracy of data entry in preparation for the data analysis activities. Weekly debriefing and supervision sessions were held to monitor data quality and improve symptom specificity on depression measures. During the course of Phase 1 data collection, tape recorders were present in all interviews for the purpose of tape recording qualitative interviews. For the duration of phase 1, all assessments and interviews were tape recorded. Of the recorded assessment interviews, 10% of the SCID assessment interviews were randomly selected for quality assurance review.

3.4.2 Data entry

All quantitative data was entered into a STATA (Version10) database for analysis. In order to ensure accuracy, all rating scale and Likert items data was double entered by the two research assistants before data sets were merged and checked for accuracy as part of data cleaning.

All qualitative data was entered into NVivo-8 using nodes and categories developed during content analysis of SCID, and during the thematic analysis of qualitative interview data.

3.4.3 Data analysis

Figure 3-8 presents an overview of each area of enquiry research question, data source and the analytic approach applied during data analysis.

Area of enquiry	Data sources	Analytic approach
Point prevalence	<ul style="list-style-type: none"> • SCID 	Mean (un-weighted) 95% Confidence Intervals Binomial, exact (Clopper-Pearson, 1934)
Symptomology and cultural context	<ul style="list-style-type: none"> • SCID 	Descriptive statistics Content analysis
Risk and protective factors	<ul style="list-style-type: none"> • SDQ • SSQ • SCID • Qualitative interviews 	Univariate analysis Multivariate analysis Analysis of narratives
Screening	<ul style="list-style-type: none"> • SCID • EPDS 	Sensitivity and specificity Cronbach's alpha to assess internal consistency Univariate and multivariate analysis ROC analysis of EPDS subscales
Contextual framework	<ul style="list-style-type: none"> • Qualitative interviews 	Analysis of narratives

Figure 3-8 Data sources and analytic approaches

3.4.3.1 Types of data and data transformations

Social support data was scored as presence or absence (along a continuum of never, sometimes and always) of two types of social support (emotional and practical), and the origin or source of the support (either from partner, mother, father, siblings or friends) predicted depression. Data was continuous and scored 1/2/3 and was not reduced, no summing of scores was undertaken, and analysis used continuous scores for each social support source.

The data collected on the SCID was coded using the DSM algorithms and reduced to a dichotomous 0/1 score labelled SCID depression outcome.

EPDS data was continuous and a ≥ 13 cut off was used as a threshold to reduce data to a dichotomous 0/1 score labelled EPDS depression outcome. To facilitate ROC analysis, subscales totals were calculated and re-scored using established methodology which is described in detail below.

3.4.3.2 Quantitative data analysis

Quantitative data analysis included principal component analysis, categorical analysis of SCID data, univariate and multivariate regression, sensitivity and specificity, and receiver operating characteristic analysis. Each is described below.

Principle Component Analysis

Exploratory factor analysis was undertaken to examine whether the various symptoms of depression reflected a single or multiple underlying latent variables of depression. Principal component analysis (PCA) techniques were used to examine groups or clusters of symptom variables around a main or principle component, and to examine the spread of symptom variance within that component. PCA involves a statistical procedure that transforms a number of possibly correlated variables (in this case the symptom variables) into a smaller number of orthogonal variables called principal components. The first principal component accounts for as much of the variability in the data as possible, and each succeeding component accounts for as much of the remaining variability as possible (Field, 2005). A scree plot was used to inspect components. Each of the 18 individual symptoms captured in the 13 SCID variables was entered separately into the PCA. For example, self-harm was entered with each of the sub-classifications (thoughts, plans and action) rather than as a summary score; likewise, sleep disturbance (delayed sleep, middle insomnia, early waking and hypersomnia) was entered with all four sub-classifications.

Categorical analysis SCID interview notes

In addressing the cultural factors which mediate the reporting of depression the data source used for this analysis was the qualitative notes written on the SCID interview questionnaire. The SCID data was already organised into a format of pre-planned questions delivered in a semi-structured nature during the interview, hence no thematic analysis was required or appropriate. Content analysis (Weber, 1990), which focuses on the coding of responses by these already identified symptom categories in order to identify common responses within each of these questions was used instead. Content analysis is theory-driven, and while the identification of categories is a qualitative process, the analysis of data is primarily quantitative. Data analysis used a process of content analysis to identify categories of responses representing specific concepts for each depressive symptom. Once common categories were identified and coded, these were assessed using a constant comparative analysis to determine summary

concepts within each inclusive and mutually exclusive category. Thereafter, data was entered into NVivo-8 along with matching individual quotations (labelled by participant code) from the SCID hand-written interview notes to facilitate counting and summary descriptions of data. Categories with coded data were then used to establish counts and frequencies, illustrating the most common language, terminology and conceptual representation of depression symptoms.

Univariate Analysis

The data sources used to investigate the factors associated with depression were as follows: the SCID depressed or not depressed (0/1) dichotomous outcome variable was used as the dependent variable, and the sample characteristic variables sourced from the SDQ, and social support variables sourced from the SSQ, were used as independent variables during the analysis.

Univariate analysis examined each of the socio-demographic variables against the outcome measure to determine which variables showed a significant relationship to depression. Univariate analysis also examined each of the social support variables against the outcome measure to determine which variables showed a significant relationship to depression.

Multivariate Analysis

Variables found to be significant ($p \leq .05$) in the univariate analysis were then entered into multivariate analysis in the order of log likelihood ratios, entering variables from highest to lowest log likelihood. Three models were examined. If appropriate, interactional effects were examined.

Model 1 = significant socio-demographic variables associated with depression.

Model 2 = significant social support variables associated with depression.

Model 3 = significant socio-demographic and social support variables associated with depression

Sensitivity, specificity, reliability and item analysis of EPDS

Data analysis examined the sensitivity and specificity of the EPDS scale against the gold standard depression outcome, in the first instance using the international clinical standard of ≥ 13 , and thereafter, using a variation of cut-off points.

Reliability analysis was undertaken to determine the internal consistency of the EPDS.

In order to determine whether any specific EPDS items were associated with scoring positive for depression, univariate analysis was used to assess each of the ten EPDS items against the main depression outcome determined by the structured interview. Items showing significant association were then entered into multivariate analysis and regressed against the main depression outcome. The outputs of this analysis informed the analysis of shorter subscales of the EPDS which is described below.

Receiver Operating Characteristics

Receiver operating characteristic analysis (ROC) (Kraemer, 1992) allows researchers and clinicians to evaluate the ability of screening tools to discriminate individuals with a characteristic from individuals without the characteristic.

In ROC analysis, one obtains an ROC curve in which the sensitivity is plotted against the specificity for each value of the test. ROC analysis is a non-parametric test, and the most common way to index the probability that a test will correctly classify participants is with the area under the curve (AUC). The AUC is defined as the probability that a randomly selected case will score higher than a randomly selected control on the test variable. The AUC is a measure of the overlap in distributions between cases and controls and is indexed from 0 to 1 (Fresco, Mennin, Heimberg, & Turk, 2003; Zou, O'Malley, & Mauri, 2007).

Values which are greater than 0.50, are interpreted as having a probability greater than chance. A particular strength of ROC analysis is that the test is robust even when representation of cases and controls is unequal in the sample (Rice & Harris, 1995). Four versions of the EPDS were tested for sensitivity and specificity using ROC analysis. The full 10 items EPDS, along with the traditional two subscales (the 3 item anxiety and the 7 item depression subscales) and a new cluster of 3 items identified through item regression analysis were examined using ROC analysis to plot sensitivity and specificity in predicting the outcome of depression. A previously reported scoring technique (Kabir, Sheeder, & Kelly, 2008) was used to make subscale scores equivalent to total scores. To compensate for the items that were removed, subscale scores were multiplied by a constant: (10) and divided by the number of scale items included. The same diagnostic cut off ≥ 13 was used for all subscale versions of the scale.

3.4.3.3 Qualitative data analysis

The analytic approach adapted for qualitative interview data involved two phases and was adapted from Stevens and Tighe Doerr (1997) analysis of narrative approach.

Analysis of narratives

The steps in the analysis of narratives followed the multi-staged narrative analysis technique (Stevens, 1993; Stevens & Doerr, 1997). At each stage, purposive successive readings of the interview transcripts were done to analyse story context, content and consequence. The first phase of analysis examined the circumstances of the pregnancy and the resolution described by the women, based on her interpretation of the pregnancy event. In the next phase of analysis, the context of each story and the detailed content was interrogated. Thereafter, themes and categories were identified and elaborated before these were compared and contrasted across all stories. Then, transcripts were coded and categorized to facilitate counting and grouping by story orientation, and the evaluation of the sub-themes and resolution reached by women in their narratives. The goal the analysis was both searching for commonalities and differences, and to identify patterns across interviews by category.

In practice this analytic approach involved four sequential steps.

Step 1: In this first step of the analysis, the pregnancy narrative was identified in each transcript. The pregnancy story was operationalised as the women's account of what happened when she found out she was pregnant (the response and events following the discovery of the pregnancy). The analytic process focused on identifying the *structural elements* of each of these pregnancy stories, including the identification of aspects of her orientation or the scene-setting narrative for the pregnancy, the complicating events she introduced within her pregnancy narrative, and her evaluation and resolution of these events within her story (Labov & Waletzky, 1967).

Step 2: The second step of the analysis focused on the HIV discovery story as a complicating event across all pregnancy narratives, using three categories developed by Stevens and Tighe Doerr (1997) to examine the narrator's interpretation of the HIV discovery event, including: *epiphany*, *confirmation* or *calamity* as responses. Given that the narratives explored HIV testing during pregnancy, the analysis also examined the thematic relevance of the concept

of the '*self as pollutant*' or '*infector*' of others, both child and or partner. Transcripts were coded and categorized to facilitate counting and grouping in order to identify patterns.

Step 3: In the third step the data was examined in a matrix (Lofland & Lofland, 1995; Miles & Huberman, 1994) which took HIV and depression status and socio-demographic variables into account in order to assess how they may influence the narrative account. The two most commonly identified structural plot orientations (planned and unplanned) were used to organise, compare and assess story elements. These were then further organised to include HIV status, and as a result, four narrative schemas were devised, including women with unplanned pregnancies who had tested negative (n=23), unplanned pregnancies who had tested positive (n=23), planned pregnancies who tested negative (n=5), and planned pregnancies who had tested positive (n=5).

Step 4: In the fourth and final phase transcripts were examined in detail again in their schema groupings in order to find narrative excerpts which best illuminated the analytic findings. Transcript data was entered into NVivo-8 software using the four schemas for node development, and to facilitate counting and extraction of quotations.

3.4.3.4 Triangulation

Once data analysis on individual data collection measures was completed, findings from each method were triangulated against findings from other measures. For example, findings relating to depression as measured by the EPDS and SCID were compared; and results from the PCA were compared to findings from the multivariate analysis of the EPDS items. Qualitative findings on experiences of pregnancy (unplanned/unwanted) were compared to reported variables on the socio-demographic survey.

Chapter 4

Results

4.1 Introduction

This chapter is organised into five sections, the first offers an overview of the sample, while the remaining sections present the results linked to each of the five research questions addressed in this dissertation.

Section 1: Recruitment and sample characteristics

The first section of the chapter begins with an overview of the recruitment summary followed by a description of sample characteristics before presenting the results of the analysis of data on antenatal depression.

Section 2: The prevalence and presentation of depression

The results presented in this second address the first and second research questions which were to determine the prevalence of depression, the common symptoms of depression, and the possible cultural influences on symptom reporting and a diagnosis of depression. Results on both quantitative and qualitative data collected using the adapted version of the Structured Clinical Interview for Depression (SCID), the primary data collection tool in this research, are provided. This section ends with the Principle Component Analysis (PCA) of the depression diagnostic criteria.

Section 3: The factors associated with depression

The third section of this chapter address the third research question and reports results of the psychosocial factors associated with a diagnosis of depression, using data collected on the socio-demographic and social support questionnaires. This section ends with a multivariate model of the factors associated with depression.

Section 4: Screening for depression

The fourth section of the chapter addresses the fourth research question which compares the effectiveness of the Edinburgh Postnatal Depression Scale (EPDS) screening tool with the gold standard diagnosis of depression. Results report the sensitivity and specificity of the screening tool, and present an examination of items with significant associations with depression. This section ends with the results of the receiver operating characteristic (ROC) analysis which evaluated shorter versions of the EPDS against the full scale.

Section 5: Qualitative results on women's experiences of pregnancy

The fifth and final section of the chapter addresses the final research question and presents results of the qualitative interviews exploring women's narratives about their pregnancies and testing for HIV.

4.2 Recruitment and sample characteristics

The consort diagram in Figure 4-1 offers a comprehensive summary of the participants approached, excluded, enrolled, lost to follow-up and retained at interview assessment.

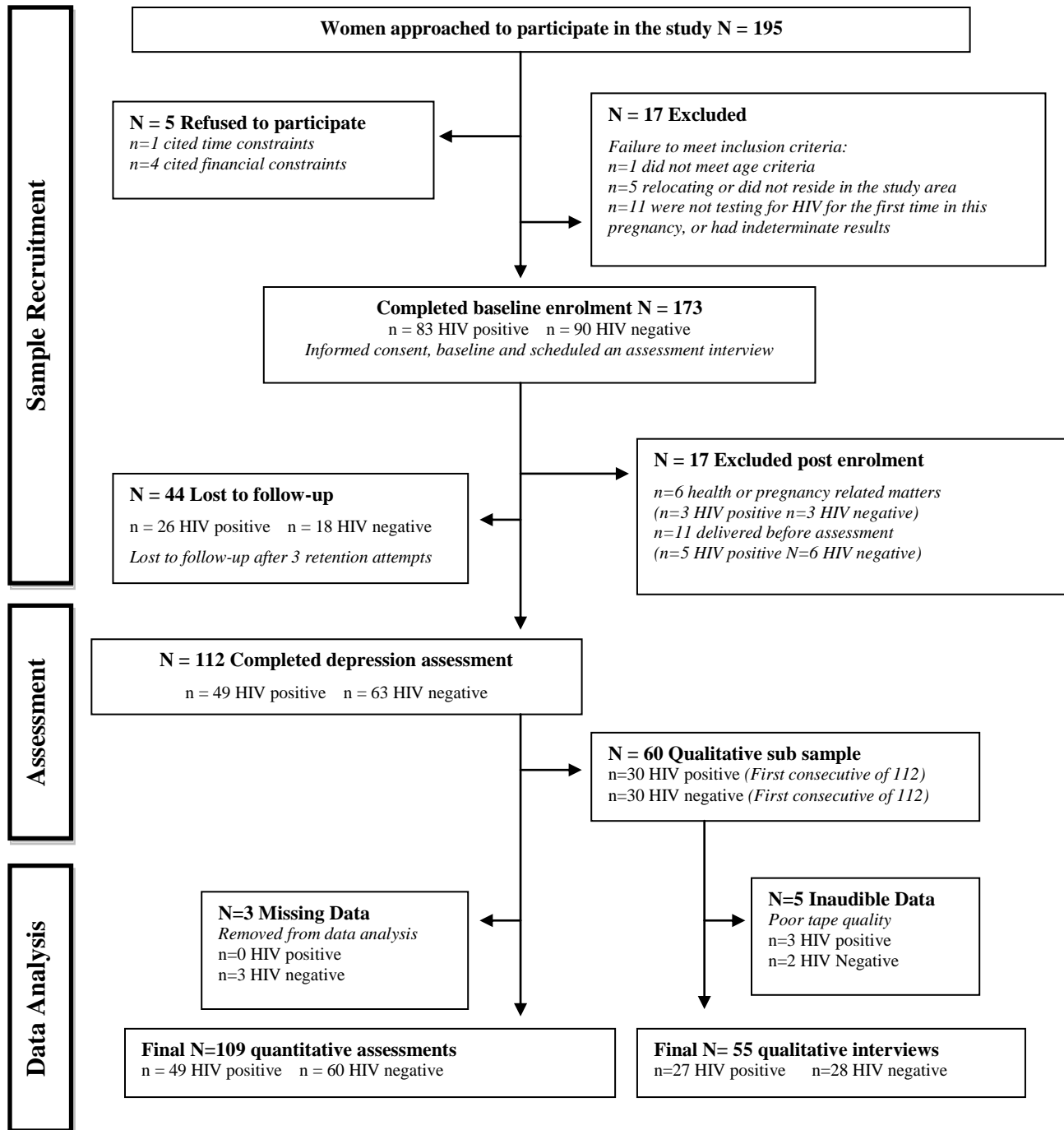


Figure 4-1 Consort diagram: Enrolment and retention

4.2.1 Recruitment summary

Of the 195 women approached for the first time at antenatal clinics during the recruitment period, five women (2.6%) refused to participate. These five women cited practical barriers such as financial constraints and in one instance, time (because they were employed), as the reasons for refusal. A slightly larger group of 17 women (8.7%) were interested and willing to participate but were excluded as they did not meet the study criteria. These women were excluded because either they had already tested and learnt their HIV status prior to, or earlier in their pregnancy, or to a lesser extent, they did not reside in the study area or were under the age of sixteen years at the time of the interview.

The remaining 173 women were eligible and willing to take part at the time of enrolment, and completed informed consent and the baseline screening. Subsequent to enrolment, a further 17 women were excluded, either as a result of pregnancy-related complications which made their participation inappropriate, or as a result of premature deliveries. Of the 195 women approached, after refusals (n=5) and exclusions (n=34), 156 women remained available to participate in the assessment interview.

Of the 156 women who were eligible and completed informed consent, 112 women completed the assessment and 44 women (28.2%) were subsequently lost to follow-up. Participants were considered lost to follow-up if they had completed enrolment, had scheduled an appointment for the interview assessment but had failed to arrive for the interview, and whom the research team were subsequently not able to contact and retain. A review of baseline data available on women lost to follow-up such as baseline depression screening results, HIV status, socio-demographic and geographic area found no significant distinguishing characteristics among them. However, HIV positive women were slightly more likely than HIV negative women to be lost to follow-up. Twenty eight HIV positive women were lost to follow-up as compared to 18 HIV negative women.

The largest group of women excluded post enrolment (n=11/17 or 65%) were excluded as a result of preterm deliveries. These women had delivered their babies preterm (between 34 and 36 weeks gestation) prior to completing the scheduled assessment interview. The numbers of HIV positive and HIV negative women in this group of preterm deliveries was similar (5:6).

At the time of this study there was a historical trend towards women presenting late in their pregnancy for their first antenatal visit, with 94.5% of the women approached already in their third trimester. While a few participants had enrolled by 26 weeks, most participants had enrolled between 28 and 34 weeks gestation.

Recruitment activities took place between November 2004 and May 2005 and second assessments were completed between January 2005 and September 2005. Figure 4-2 shows the enrolment curve by month during the recruitment period showing that recruitment was relatively stable throughout the period, with two enrolment peaks in November 2004 and February 2005, and a slight dip in enrolments in March 2005. The enrolment peaks in November and February were matched by delivery peak periods in February and March 2005 and May and June 2005.

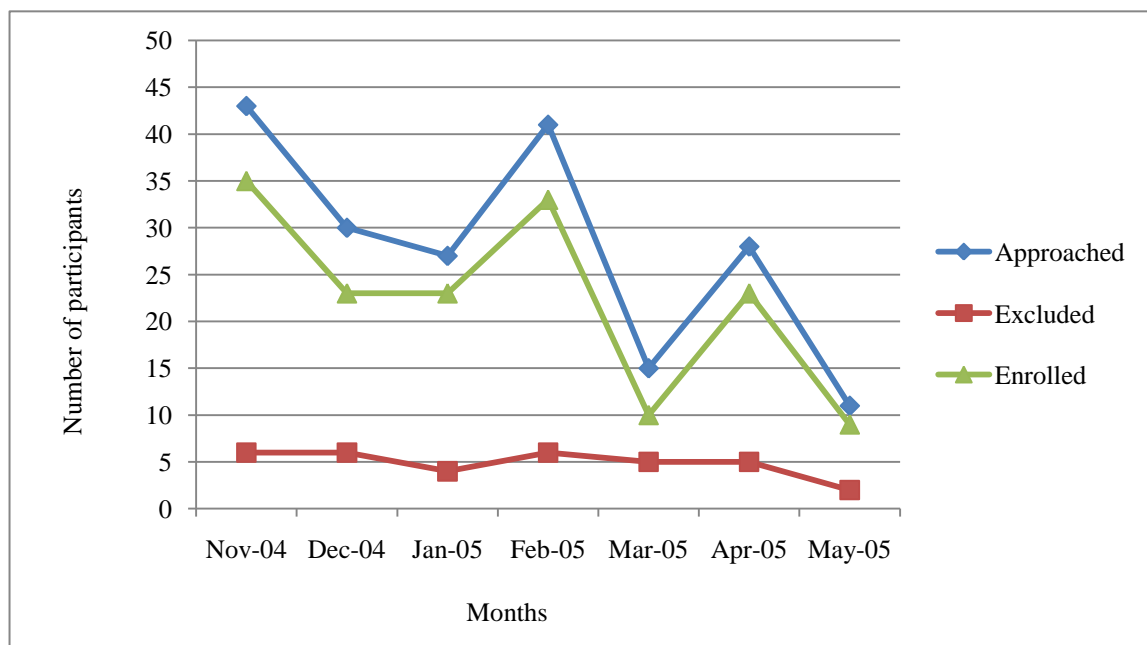


Figure 4-2 Number of women approached, enrolled and excluded by month

4.2.2 Sample characteristics

The sample characteristics of the 109 women in the final analysis are outlined in Table 4-1. With the exception of age (reported with median, range), sample characteristics are presented using number values of the total sample, along with percentages and confidence intervals.

Table 4-1

Socio-demographic characteristics of the sample

Characteristics of participants	N (109)	Percentage	95% Confidence Intervals
Age			
Median	24.6		(23.6-25.5)
Range	16-40		
Education			
No education	14	12.8 %	(13.8-14.1)
Completed primary education	38	34.9 %	(37.8-38.1)
Some secondary education	32	29.4 %	(31.8-32.1)
Completed secondary	25	22.9 %	(24.8-25.1)
Marital status			
Unmarried	100	91.7 %	(99.9-100)
Married	9	8.3 %	(8.9-9.0)
In stable relationship with partner			
Yes	98	89.9 %	(94.5-101.4)
No	7	6.4 %	(3.5-10.4)
Missing	4	3.7 %	(0.5-7.4)
Cohabiting with father			
Yes	21	19.2 %	(12.8-29.1)
No	60	55.1 %	(51.8-68.1)
Missing	28	25.7 %	(19.8-36.1)
Number of children with father			
First child	57	52.3 %	(56.9-57.0)
At least one other	52	47.7 %	(51.9-52.0)
Living arrangements			
Family	87	79.8 %	(86.9-87.0)
Non family	17	15.6 %	(16.9-17.0)
Missing	5	4.6 %	(4.9-5.0)
Regular income			
Yes	54	49.5 %	(53.9-54.0)
No	55	50.5 %	(54.9-55.0)
Grant assistance			
Child Support Grant	52	47.7 %	(50.2-53.7)
Care Dependency Grant	1	0.9 %	(0.0-2.7)
No grant	55	50.5 %	(53.2-56.7)
Missing	1	0.9 %	(0.0-2.7)

As shown in Table 4-1, most women (75%) were aged between 16 and 28 years. While a small number of women in the sample reported having no education, more than a third had completed primary level education, and half had completed some or all of their secondary level education, with almost a quarter of those having matriculated.

Marriage rates were low with most women reporting themselves to be unmarried. The majority of women reported that they were currently in a stable relationship with their partner (this included the nine women who reported being married) and this partner was also reported to be the father of this unborn child. Close to half the women had at least one other child with this partner. While current partnerships were common, few women reporting living with their partners. Most women were living in a family homestead.

When income and grant support are examined together, at least half of the women had access to a regular source of income other than government social security assistance. Sources of financial support was fairly evenly distributed with a quarter women reporting access to both a regular income and grant support; a quarter access to regular income but no grant assistance; a quarter access to a grant assistance but no regular income and a quarter reported that they did not have access to either a regular formal income or grant assistance.

Of the women reporting access to a regular income, disaggregated data on income sources showed that 20% were receiving income from their partner, 18.3% had their own income, one woman had both her own income as well as income from her partner, and the remaining 11 women received income from their mother (n=1), father (n=3), sibling (n=1), or their partner's family and others (n=5).

Reproductive health data showed that 15 women (13.8%) reported that they had planned this pregnancy; one woman had missing data, and the remaining 93 (85.3%) women had an unplanned pregnancy. HIV test results for the women enrolled in this study indicated that 49 (44.9%) of the women were HIV positive and 60 (55.1%) were HIV negative.

4.3 The prevalence and presentation of depression

The results presented in this part report the prevalence of depression and the symptomatology of women who were diagnosed with depression using the SCID. The descriptive statistics for each symptom are presented along with results of the content analysis of qualitative data from the SCID interview notes. This section ends with the results of the PCA of the symptoms of depression.

4.3.1 Point prevalence of depression

In total 51 or 46.7% (CI 37.2-56.3) of the 109 women in the sample met the criteria for a major depressive episode (MDE) while 58 (53.2%) women did not.

4.3.2 Episode duration

A third of women diagnosed with MDE reported that their depression symptoms had persisted for between two and six weeks. More than half (66.7%) of the women who were diagnosed with a MDE reported that their current episode and symptoms had persisted for more than two months. In a few cases (5.8%), the current episode duration was found to be more than six months.

4.3.3 Previous episodes

Of the women diagnosed with a current MDE, eight (15.7%) reported a previous MDE, two (3.9%) of these eight women reported that the previous MDE had occurred in the postnatal period of a previous pregnancy. Seven women who were not currently diagnosed with a MDE reported having a previous MDE – for two of these women the MDE had occurred prior to the current pregnancy, and for five of them the MDE occurred earlier in the current pregnancy, but was currently resolved. Univariate analysis of current MDE and previous history of MDE found that previous MDE did not have a significant association with current MDE (OR 1.35 CI 0.4-4.0 $p=0.585$) but the numbers involved were very small. One woman in the sample, who was diagnosed with a current MDE, also reported having experienced bereavement in the preceding year. While the bereavement had occurred during the current pregnancy (6 months prior to the

SCID interview date) the symptoms reported by this participant (including suicide ideation) were not better accounted for by a differential diagnosis of bereavement.

4.3.4 Frequency of symptoms

Table 4-2 lists the total number of symptoms reported by the 109 women in the sample.

Table 4-2

Aggregated numbers of symptoms recorded for Criteria-A and Criteria-B

Criteria A	Freq.	%	Cum. %	Criteria B	Freq.	%	Cum. %
0 symptom	31	28.4	28.4	1 symptom	15	13.8	13.8
1 symptom	23	21.1	49.5	2 symptoms	13	11.9	25.7
2 symptoms	55	50.5	100.0	3 symptoms	15	13.8	39.5
<i>Mood alone (13)</i>				4 symptoms	28	25.7	65.2
<i>Loss of interest alone (10)</i>				5 symptoms	13	11.9	77.1
<i>Mood & Loss of interest (55)</i>				6 symptoms	13	11.9	89.0
				7 symptoms	12	11.0	100.0
Total	109	100	100.00		109	100.0	100.0

The level of symptomatology among the 109 women was high, with the mean number of symptoms reported being 5.11 (SE 0.23 CI 4.64-5.59). Half the women scored positive for the presence of both depressed mood and loss of interest symptoms on Criteria-A (50.5%), while more than half (65.1%) scored positive for the presence of at least 4 symptoms on Criteria-B. Many women (25.7%) had at least four symptoms, and 24.8% had between 5 and 7 symptoms present on Criteria-B. Table 4-3 lists frequencies of Criteria-A and Criteria-B symptomatology, from highest to lowest frequency. The most frequently reported symptoms among women were changes in weight and/or loss of appetite (97.3%), and fatigue or loss of energy (63.3). These three somatic symptoms are easily confused with normal pregnancy-related changes and can overestimate depressive symptoms.

Table 4-4 shows the results of the symptom frequency when the contributions of the symptoms of weight change or loss of appetite and fatigue or loss of energy are removed from the analysis. When possible pregnancy-related somatic symptoms are removed, 45.8% of women still scored positive for the presence of between 3 and 5 Criteria-B symptoms.

Table 4-3

Frequency of symptoms on Criteria-A and Criteria-B

Criteria-A	Frequency	Percent
Both depressed mood and loss of interest	55	50.5
No depressed mood <i>or</i> loss of interest	31	28.4
Depressed mood <i>or</i> loss of interest	23	21.1
Criteria-B	Frequency	Percent
Appetite <i>or</i> weight change	106	97.3
Fatigue <i>or</i> low of energy	69	63.3
Concentration <i>or</i> decision-making	59	54.1
Sleep disturbance	58	53.2
Worthlessness <i>or</i> guilt	58	53.2
Agitation <i>or</i> retardation	45	41.3
Suicide Ideation	30	27.5

Table 4.4

Criteria-B symptom frequencies with pregnancy related symptoms removed

Criteria A	Freq.	%	Cum. %	Criteria B (– 2)	Freq.	%	Cum. %
0 symptom	31	28.4	28.4	0 symptom	18	16.5	16.5
1 symptom	23	21.1	49.5	1 symptoms	21	19.3	35.8
2 symptoms	55	50.5	100.00	2 symptoms	20	18.4	54.1
				3 symptoms	25	22.9	77.1
				4 symptoms	11	10.1	87.2
				5 symptoms	14	12.8	100.0
Total	109	100	100.00		109	100.0	100.0

Table 4-5 gives overview of all the individual symptom frequencies of both Criteria-A and Criteria-B symptoms by depression status for all women. Close to half of the women reporting depressed mood or loss of interest were subsequently diagnosed with a MDE. Most women with MDE reported both depressed mood and loss of interest. The most frequently reported symptoms among all women were weight change, loss of energy and loss of appetite. Almost all women reported weight change, while three quarters of women reported loss of energy and loss of appetite. Just over half of the women reported having a sleep disturbance; a third of women reported worthlessness or guilt and having difficulty with concentration or making decisions. Smaller numbers of women reported symptoms of agitation or retardation and suicide ideation.

Table 4-5

Summary scores for Criteria-A and Criteria-B symptoms by depression

Depressed mood	Absent	Present	Loss of interest	Absent	Present
Not depressed	39	19	Not depressed	38	20
Depressed	2	49	Depressed	6	45
Total (%)	41 (37.6%)	68 (62.4%)	Total (%)	44 (40.4%)	65 (59.6%)
Loss of appetite	Absent	Present	Weight change	Absent	Present
<i>Not depressed</i>	29	29	<i>Not depressed</i>	4	54
<i>Depressed</i>	13	38	<i>Depressed</i>	4	47
Total (%)	42 (38.5%)	67 (61.5%)	Total (%)	8 (7.3%)	101 (92.7%)
Energy	Absent	Present	Sleep disturbance	Absent	Present
Not depressed	31	27	Not depressed	38	20
Depressed	9	42	Depressed	13	38
Total (%)	40 (36.7%)	69 (63.3%)	Total	51 (46.8%)	58 (53.2%)
Agitation	Absent	Present	Retardation	Absent	Present
Not depressed	50	8	Not depressed	49	9
Depressed	40	11	Depressed	30	21
Total (%)	90 (82.6%)	19 (17.4%)	Total (%)	79 (72.5%)	30 (27.5%)
Worthlessness	Absent	Present	Guilt	Absent	Present
Not depressed	46	12	Not depressed	43	15
Depressed	20	31	Depressed	30	21
Total (%)	66 (60.5%)	43 (39.5%)	Total (%)	73 (66.9%)	36 (33.1%)
Concentration	Absent	Present	Decision-making	Absent	Present
Not depressed	46	12	Not depressed	44	14
Depressed	16	35	Depressed	23	28
Total (%)	62 (56.8%)	47 (43.2%)	Total (%)	67 (61.5%)	42 (38.5%)
Suicide ideation	Absent	Present			
Not depressed	55	3			
Depressed	24	27			
Total (%)	79 (72.5%)	30 (27.5%)			

4.3.5 Criteria-A symptomatology

The following section examines each individual Criterion-A symptom in greater detail, reporting on both quantitative and qualitative data from the note taking on the adapted SCID.

4.3.5.1 Mood

Sixty-eight of the 109 women in the sample (62.4%) scored positive for the presence of depressed mood during pregnancy. Almost all the women with MDE (n=51) scored positive for the presence of depressed mood (49/51 or 96%). A third of the women who were not diagnosed with depression (19/58 or 33%) also reported depressed mood.

Content analysis of SCID interview notes recorded in response to the depressed mood item “What has it been like for you?” found that responses used by women to describe their experiences of depressed mood fell into three conceptual categories. These three categories included:

- Emotional expression of depressed mood: Women’s responses were coded and counted in this category if they used emotional terminology and language similar to that of DSM-IV-TR diagnostic criteria to describe the abstract emotional experience of depressed mood with the use of predominantly ‘*feeling*’ based language.
- Somatic expression of depressed mood: Women’s responses were coded and counted in this category if women described their emotional experiences of depressed mood with somatic descriptions and used ‘*physically*’ based language to describe abstract emotions in a concrete and tangible way.
- Metaphoric expression of depressed mood: Women’s responses were coded and counted in this category if they used ‘*metaphorically*’ based language as a means to combine emotional (feeling based) and somatic (physical based) experiences into a personal narrative which expressed the ‘physical’ experience of the ‘emotional’ feeling.

Table 4-6 provides an overview of each category along with examples of commonly coded expressions for that category.

Table 4-6

Categories used to code and count descriptions of depressed mood

Categories	Concepts	Common expressions
Emotional Expressions	Emotional descriptions <i>Feeling based language</i>	<i>I feel sad, so sad that I am crying all the time</i> <i>I feel very down</i> <i>I feel very unhappy</i> <i>I feel tearful and upset</i> <i>I feel like everything gets on top of me</i> <i>I feel stressed and emotional</i> <i>I feel irritated and frustrated</i> <i>I feel moody</i> <i>I feel like I am not okay emotionally</i>
Somatic Expressions	Somatic descriptions <i>Physically based language</i>	<i>My body is weighed down</i> <i>My body is heavy and slow</i> <i>Things are pushing/pressing down on me</i> <i>My head hurts from the sadness</i> <i>The sadness makes my stomach hurt</i> <i>My head feels like bursting</i>
Metaphoric Expressions	Metaphorical descriptions Mix of <i>physical</i> and <i>emotional</i> language to build a <i>metaphor</i>	<i>It is like somebody stabbed me in my heart and I am bleeding tears inside</i> <i>I am heart sore, my heart aches all day</i> <i>My heart is heavy, there is pain in my heart</i> <i>I am changed, my heart is sick, it doesn't want to love anymore</i> <i>In my heart I am so sad, my heart is crying</i> <i>My heart is broken, like sadness is tearing my heart</i>

Table 4-7 outlines frequencies (from highest to lowest) with which each category was used to describe depressed mood among the 68 women who scored present for depressed mood.

Table 4-7

Frequency of expressions of depressed mood by category from highest to lowest

Categories of depressed mood	Freq.	Percentage
<i>Emotional expression alone</i>	44	64.7 %
<i>Emotional and somatic expression together</i>	9	13.2 %
<i>Metaphoric expression alone</i>	6	8.8 %
<i>Somatic expression alone</i>	4	5.8 %
<i>Emotional and metaphoric expressions together</i>	3	4.4 %
<i>Somatic and metaphoric expressions together</i>	1	1.4 %
<i>Emotional, somatic and metaphoric expressions</i>	1	1.4 %
Totals	68	100.0

Table 4-7 shows that most women (64.7%) who reported depressed mood did so using emotional or feeling based language similar to language used in DSM-IV-TR diagnosis criteria. As one woman distinguished:

“I am not okay, I mean physically I am okay, but emotionally I am not okay” (P79)

The most frequently used word to describe depressed mood was feeling ‘sad’, which was reported by 39 (88.6%) of the 44 women using emotional expressions to describe depressed mood. In examining the concept of sadness more closely, results show that among the 39 women reporting sadness, 36 (92.3%) had made reference to excessive crying or tearfulness as a means to describe the depth or nature of their feeling of sadness. As related by one woman:

“I feel so sad and I end up crying, and at times I cry without any sound reason” (P91)

Sadness was a pervasive concept which emerged in all three categories and was seldom reported in isolation. Women who combined emotional expressions with other categories were more likely to combine emotional with somatic expressions such as headaches and heaviness. As this example of one woman’s expression illustrates:

“I feel very sad all the time, like I am weighed down, like my body is heavy and I don’t feel like talking” (P83)

However, when somatic or metaphoric expressions were offered alone, metaphoric expressions such as feeling ‘heartbroken, heart sore or heart sickness’ were slightly more frequently reported than somatic expressions such as ‘body aches or headaches’ (6:4).

A small group of women (16.0%) reported feeling low or down, making direct reference to the construct of mood when describing their experience of depressed mood. As one woman stated:

“My mood is getting lower and lower, and I feel very down and I don’t enjoy things” (P38)

4.3.5.2 Loss of interest or Anhedonia

Sixty five women (59.6%) of the 109 women in the sample scored present for loss of interest, only marginally fewer than scored present for depressed mood. Most women diagnosed

with depression scored present for loss of interest (45/51 or 88%). A third of women not diagnosed with depression (20/58 or 34%) reported loss of interest.

The experience of Anhedonia relates to the inability to experience pleasurable emotions from normally pleasurable life events such as eating, exercise, social interaction or sexual activities. Content analysis of SCID interview notes recorded in response to the loss of interest item “What kinds of things have you lost interest or pleasure in?” found that responses most commonly reported loss of interest or pleasure in relation to three activities:

- Loss of interest or pleasure in being close with partners: Of the 65 women who scored positive for loss of interest, thirteen women (20%) reported less interest or pleasure in their relationships with their partners and in spending time and being close with them, as one woman pointed out:

“Yes, [I have lost interest in things that I used to enjoy] like being with my partner, being close with him, you know enjoying each other, or even socialising or chatting with him, I don’t enjoy that anymore” (P83)

A small group of four women (6%) also reported less interest or pleasure in intimate activities and sexual relations. As one woman stated:

“Yes, [I have lost interest in things that I used to enjoy] like enjoying the physical pleasures of my partner, it’s no longer nice” (P85)

More directly another woman stated:

“I don’t want to be close with him, you know to have sex, like I used to” (P5)

- Loss of interest or pleasure in social engagements with family and friends: Twenty women (31%) reported having less interest or pleasure in spending time socialising with their family and friends. As these women stated:

“I used to enjoy travelling, visiting relatives, socialising, but I’m not like that anymore” (P64)

“Yes, like visiting my relatives and friends, or taking walks with them, even being with other people, I don’t enjoy that socialising anymore” (P100)

- Loss of interest or pleasure in taking part in social and community activities: Seven women (11%) reported less interest or pleasure in taking part in specific activities such as no longer enjoying or attending church functions, family celebrations, parties and community events. As this woman explained:

“Things like church or visiting my relatives, I am no longer enjoying it” (P93)

4.3.5.3 Mood and loss of interest

Half of all the women in the sample (55/109) scored present for both depressed mood and loss of interest, resulting in a large degree of overlap on Criteria-A symptomatology. Cross tabulation results for depressed mood and loss of interest by depression status are shown in Table 4-8.

Table 4-8

Mood and loss of interest by depression status

Depression case	<i>Neither depressed mood or loss of interest</i>	<i>Both depressed mood and loss of interest</i>	<i>Depressed mood only</i>	<i>Loss of interest only</i>	Total
Not depressed	31	12	7	8	58
Depressed	0	43	6	2	51
Totals	31	55	13	10	109

The majority of women diagnosed with depression reported both mood and loss of interest (43/51 or 84%). Among the group of depressed women only 6/51 reported depressed mood and no loss of interest, and only 2/51 reported loss of interest but no mood symptom.

Among women who were not depressed (2/58 or 20%) reported the presence of both depressed mood and loss of interest, while 31/58 (53%) reported neither depressed mood nor loss of interest. Low numbers of women presented with either depressed mood with no loss of interest (6/52 and 7/58) or loss of interest with no depressed mood (2/51 and 8/58) across both depressed and not depressed groups.

4.3.6 Criteria-B symptomatology

The following section examines each individual Criteria-B symptom in greater detail.

4.3.6.1 Loss of appetite

Over half (67/ 109 or 61.5%) of the women in the sample reported loss of appetite. Three quarters of the depressed women reported loss of appetite (38/51 or 75%). Reporting of loss of appetite among non-depressed women was lower than depressed women (29/58 or 50%), with only half of the non-depressed women reporting this symptom.

Results of content analysis of SCID responses to the item “in what way has your appetite been affected” found that women most frequently described normal pregnancy-related appetite changes such as feeling ‘choosy’ and not being able to enjoy particular food, whilst maintaining a healthy appetite. This was considered sub-threshold and did not score present for loss of appetite. For example, women stated:

“I don’t feel like eating certain food anymore, even the way they smell puts me off” (P 108)

Depression-related loss of appetite (which was considered threshold and scored present for loss of appetite) was distinguished from this as being mood-related and distinct in featuring less desire to eat regardless of food type. As these women stated:

“When I think a lot I don’t want to eat” (P 61)

“I have lost my appetite, I don’t feel hungry at all and I have to force myself to eat” (P 97)

4.3.6.2 Weight change

To score present for weight change as a depressive symptom, weight change has to be evidenced by at least 5% difference in weight in either direction. Weight gain could be expected as a normal part of pregnancy, whereas weight loss would be atypical of pregnancy.

Weight change was the most commonly reported symptom with almost all women in the sample 101/109 (93%) reporting it.

Among women who were depressed (47/51 or 92%) reported weight change. Further analysis of weight change data showed that among depressed women, weight change included both weight gain (33/51 or 65%) and weight loss (14/51 or 27%), with the remaining 4/51 (8%) reporting no change in weight.

Among women who were not depressed, weight change was also highly reported (54/58 or 93%), however, in the non-depressed group, reporting of weight gain was much more common (46/58 or 79%) as compared to reporting weight loss (8/58 or 14%), while similar numbers of women (4/58 or 8%) reported no weight change as compared to the depressed group.

When comparing results across the two groups, reporting weight change was equally likely among depressed and non-depressed groups, however, the numbers of depressed women reporting weight loss was almost double that of non-depressed women (14:8).

4.3.6.3 Sleep disturbance

Sleep disturbance was common, with just over half (58/109 or 53%) of all women reporting the presence of a sleep disturbance.

Much higher numbers (38/51 or 75%) of depressed women reported sleep disturbance as compared to those who were not depressed (20/58 or 35%).

Among the 38/51 depressed women reporting sleep disturbance, most reported more than one type of sleep disturbance, and many women reported features of at least three types of sleep disturbance, of which middle of the night insomnia and early waking were most frequent, and hypersomnia the least common.

Results of content analysis of SCID responses on sleep disturbance to the item “what has caused you difficulty in sleeping” found that depressed women were more likely to report thoughts and worries as interfering with their ability to sleep, while non-depressed women tended to report pregnancy-related reasons for sleep disturbance, as illustrated in these two example quotes:

“I am just uncomfortable now, so it happens that I wake up for no reason” (P10)

“I find myself thinking and worry about things and then I cannot sleep” (P20)

4.3.6.4 Agitation

Symptoms of agitation and restlessness were not particularly common amongst the women in this sample, with only 19/109 (17%) scoring positive for this symptom.

The low numbers of women reporting agitation was similar among both depressed and non-depressed groups: among depressed women 11/51 (22%) reported agitation, while only 8/58 (14%) non-depressed women reported agitation.

A review of SCID responses showed that while many women made reference to signs of agitation, most reported that it was not significant enough that others had noticed, which resulted in a score of absence of agitation.

Content analysis of SCID items found that women were very specific in their identification of agitation as being psychological in origin rather than pregnancy-related. Among women who reported agitation, it was described as follows:

“My family says I move too much, I do this and do that, my head is filled with things and that I am all over and can’t sit still” (P 79)

“People notice that I am very busy with things all the time, even though I am pregnant” (P 92)

4.3.6.5 Retardation

While reports of retardation were fairly low (less than a third of all women reported it (30/109 or 28%), although reports of retardation were almost double that of agitation (17%).

Close to half of the depressed women reported retardation 21/51 (41%) while only 9/58 (16%) of non-depressed women reported retardation.

A review of SCID responses found that many women described signs of retardation as a pregnancy-related side effect, but that the severity of retardation fell below the level required to meet a threshold present score.

Content analysis results showed that the SCID responses poorly discriminated whether the experience of retardation was as a result of depression or as a result of pregnancy-related side effects. Women were not necessarily able discriminate the cause of retardation as being separate

from pregnancy-related physiological change. Among women who did report retardation, most did so by citing retardation in household chores and work. These symptoms could be seen to overlap with concentration and loss of energy.

“I am not able to do that many things, even at work, everything about me is slower” (P 98)

“I am slow in the way I move and do things; I can’t even get all the household chores done on time, and keep up with conversation” (P 102)

4.3.6.6 Fatigue or loss of energy

High numbers of women in this sample (69/109 or 63.3%) reported loss of energy or fatigue.

The proportion of depressed women (42/51 or 82%) reporting loss of energy was almost twice as high as those who were not depressed (27/58 or 47%).

Content analysis of SCID responses found that women most frequently described loss of energy in terms of feeling low and flat, as one woman stated:

“I feel very slow and flat; I don’t even feel like talking to people” (P 33)

And another stated:

“My energy is very low, too low, I feel pushed down” (P 57)

Women appeared able to discriminate between pregnancy-related losses of energy and non-pregnancy related loss of energy. References to normal pregnancy-related symptoms, frequently linked to a reduction of mobility as the pregnancy advanced, were qualitatively different from those women reporting that they had low or flat energy unrelated to the pregnancy, as described above.

The example below illustrates pregnancy-related loss of energy.

For example, women stated:

“As I am getting on in the pregnancy I feel lazier, I am not as active as before” (P 64)

4.3.6.7 Worthlessness and guilt

More than half the women in the sample reported either worthlessness or guilt. Slightly more women reported feeling worthless (43/109) than feeling excessive guilt (36/109).

Worthlessness was more frequently reported among depressed women than among non-depressed women. Among depressed women (31/51 or 60%) scored positive for worthlessness while only 21/51 (41%) scored positive for excessive guilt.

This trend was reversed among women who were not depressed, with only 12/58 (21%) scoring positive for worthlessness while higher numbers (15/58 or 25%) scored positive for excessive guilt. While the trend is reversed, the numbers are small and the difference slight.

Depressed women made up the majority of the women in the sample (43/109) reporting worthlessness (31/43 or 72.1%). They also made up the majority (21/36 or 58%) of all 36/109 women reporting excessive guilt in the total sample.

Content analysis of SCID responses shows that women used common Western terms to describe how they were feeling about themselves in terms of their sense of worthlessness, for example, women made statements such as:

“I feel worthless, I don’t have any value, I am not important to anybody” (P105)

Almost half the women who scored positive for worthlessness, regardless of whether they were depressed or not, made reference to the fact that this feeling of worthlessness was new to them: 21/43 of these women described experiencing a significant change or shift in how they felt about, or perceived themselves in recent weeks and months:

“I am no longer the person I used to be” (P13)

Many women reporting worthlessness explained that the change they felt related to losing pride in themselves and having a feeling of lowered self-worth and self-esteem:

“Things have changed and I don’t feel the same anymore, I don’t feel proud of myself” (P27)

“I don’t feel the same anymore, I feel ashamed of myself” (P38)

Women who reported excessive guilt tended to narrate these feelings in relation to the pregnancy being unplanned and to their HIV status. For example, one woman said:

“I wish I did not do this, I did this to myself, I should have done things different but I have failed now and it’s my entire fault” (P2)

4.3.6.8 Concentration and decision-making

Slightly more women reported the presence of concentration difficulties (47/109 or 43%) than reported problems with decision-making (42/109 or 38%).

A high proportion of the total reported problems with concentration (47/109) and decision-making (42/109) in the sample were reported by the depressed group of women (35/47 or 75% and 28/42 or 67% respectively).

Among depressed women (35/51 or 68%), 28/51 (54%) reported concentration and decision-making difficulties.

Among non-depressed women, reporting of either symptom was low, with less than a third of women (12/58 or 20%) reporting difficulties with concentration and 14/58 (24%) reporting difficulties with decision-making.

Content analysis of SCID responses found that women most frequently described their concentration difficulties as feeling ‘easily distracted’ or being ‘forgetful’, as this woman stated:

“In the middle of things, I forget what I am doing” (P105)

Since almost all the women were unemployed, most women related difficulties with concentration with reference to household tasks, as this was the main daily activity they were engaged in. As illustrated in these examples:

“Yes, like shifting backwards and forwards in household tasks and not finishing things” (P30)

“Like when I am cooking, I burn my hand without even noticing it (P82)

Women also described varying levels of severity in concentration and decision-making difficulties. For example, in a more severe case one woman said:

“I can’t manage to do even normal things, like household things, the backbone of life is gone” (P73)

And in another less severe case a women said:

“It’s not that bad that my plans get affected, it’s just hard to think sometimes” (P64)

In relation to decision-making, women related that they often failed to make decisions or to follow through on decisions. For example, women said:

“Things used to be normal, but now I have a problem finishing things” (P99)

“I change my mind a lot and I am very emotional” (P103)

Women related a general avoidance around decision-making and completing tasks, as this woman stated:

“I postpone things and I don’t want to do anything” (P102)

Many women reported having ‘intrusive thoughts’ which interfered with daily activities, concentration and decision-making.

“I am worried in a way that I can’t even think straight” (P53)

“Sometimes it’s when I am alone, but even if people are there, but if they are not talking, then these thoughts come” (P19)

4.3.6.9 Suicide ideation

Suicide ideation in this sample was high, with 30/109 (27.5%) women expressing some level of suicidal ideation.

SCID items on suicide ideation record present/absent on three sub-classifications, including:

- a) Had thoughts that they would be better off dead and/or had thoughts of harming themselves;
- b) Had made plans about how they would harm themselves;

c) Had taken action towards harming themselves or ending their life.

Suicide ideation was particularly common among depressed women, with over half (27/51 or 53%) of the depressed women being suicidal. In contrast, only 3/58 or 5% of non-depressed women reported suicidal ideation.

All 30 of the 109 women reporting suicide ideation reported either having had “*thoughts of harming themselves*” or “*thoughts they were better off dead*”. High numbers of those 30 suicidal women reported having made plans (24/30 or 80%), while only 2/30 (6%) had made previous suicide attempts.

The three women who reported suicide ideation but were not depressed, had planned how they might go about harming themselves.

Likewise, over three quarters of the depressed suicidal women (21/27 or 77%) had planned how they might harm themselves.

In describing how they might harm themselves, most women reported thinking about drinking paraffin or poison (13/24), drowning themselves (5/24), hanging themselves with rope (3/24), burning themselves (2/24), or throwing themselves in front of a car (1/24).

Content analysis of SCID responses for suicide ideation found that women who were suicidal felt desperate, and unable to resolve the issues concerning them. Death was described as a reprieve from what appeared to be insurmountable problems. Women reporting suicide ideation expressed their suicidal ideation with a similar pattern of narratives, favouring ‘better off dead’ over more directly stating they would like ‘to commit suicide or harm themselves’. For example, women said:

“It would be better if I wasn’t around because I can’t deal with this” (P105)

“I feel like I have lost my pride, it’s better to end my life things are so bad” (P82)

Content analysis found that social conflict was common among suicidal women. Most women (25/30 or 83%) reported partnership conflict, citing the unplanned/unwanted pregnancy and/or HIV testing as being instrumental to their suicidal feelings:

“Especially if I have quarrelled with my partner, then these feelings are worse” (P19)

“Often I think about the love that is lost between me and my partner over this pregnancy and then I just feel like I want to be dead, all is lost now and I don’t have a reason to live, he does not want me and he does not want the baby” (P31)

“In my lowest times, when I want to end it all I am thinking about my partner, that is the matter that is concerning me the most when I feel this way”(P38)

“This unplanned pregnancy and that I am not having a hope in my life in the future or with my partner after I got my blood results, I thought I could be a great wife before, but things aren’t the same at all, so there have been times that I have thought about ending my life” (P73)

The five women who did not report partnership conflict reported family conflict resulting from the unplanned pregnancy as leading to the suicidal thoughts. One woman said:

“Due to the situation that I face of having no parents and my sister having left her kids for me, and my uncle having so much anger that I am pregnant, I just feel like screaming a lot, most of the time my thoughts become wild and I feel like disappearing and leaving everything behind, that I should be dead so it can all go away” (P40)

“I feel such pain in my heart, I have all these thoughts and there are no solutions, and my mother is just scolding me all the time, I think I will be better dead” (P57)

Particular events were cited as leading to a sense of crisis and increased suicidal feelings; two scenarios were most common in the content analysis. Firstly, feeling overwhelmed by learning one’s HIV positive status among HIV positive women, followed closely by feeling overwhelmed by the implications of the unwanted pregnancy among both HIV positive and negative women:

“I was not happy before, but now with my HIV status and the pregnancy it has made it worse, like I just think of ending it all” (P12)

Almost no women made reference to the implications of suicide for the current fetus or any other children, except in the case of one HIV positive woman who stated:

“I am going to die anyway, not matter how you look at it, either I will leave this baby behind and somebody will abuse it, or it will die with much suffering because I have infected it, it is better if I just end it for both of us now” (P27)

Given these responses, further examination explored comparisons between suicide ideation and HIV status. Results show that equal numbers of HIV positive and negative women were suicidal. Among women who had made self-harm plans, slightly more were HIV positive (13) than were HIV negative (11). The two women who had attempted suicide were both HIV positive.

Despite reporting suicide ideation, in the majority of cases (21/30 or 70.0%), women were judged by a clinical psychologist to be not actively suicidal following the interview. The two cases of previous attempted suicide are described in greater detail in the case studies included in Appendix F.

4.3.7 Principal component analysis

The principle component analysis examined the underlying factor structure of the construct of depression as diagnosed by a set of symptoms recorded on the SCID. The results of the analysis demonstrate that one principal component accounted for most of the variance. Figure 4-3 below shows the scree plot of eigenvalues with a clear point of inflexion after Component 1 (Cattell, 1966).

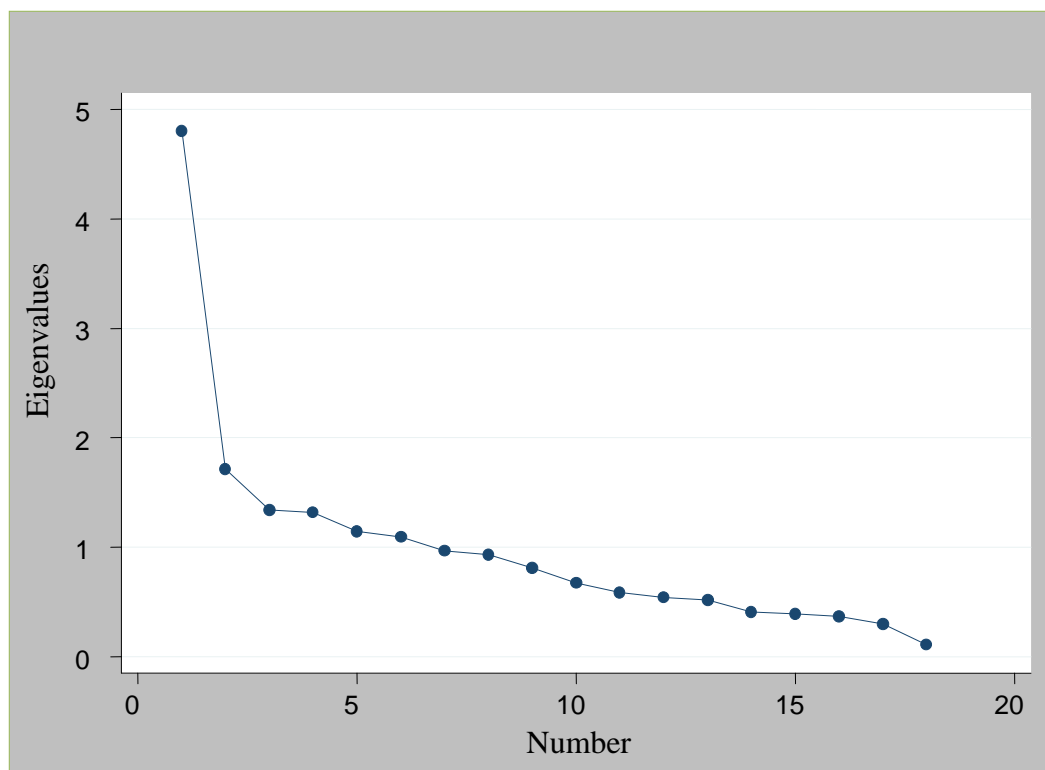


Figure 4-3 Scree plot for eigenvalues after principal component analysis

Stevens (1992) suggests that the scree plot provides a reliable criterion for factor selection with a sample of more than 200 participants, but since this sample includes only 109 participants, Kaisers' (1960) recommendation of retaining all factors with eigenvalues greater than 1 is considered an appropriate approach. Using this recommendation Components 1 - 6 represent a substantial (>1) amount of variation. As shown in Table 4-9, Component 1 is responsible for the most significant proportion of the variance (0.2668).

Table 4-9

Principle components (correlations)

Component	Eigenvalues	Proportion
Component 1	4.80176	0.2668
Component 2	1.71194	0.0951
Component 3	1.33789	0.0743
Component 4	1.31541	0.0731
Component 5	1.14289	0.0635
Component 6	1.09179	0.0607

Table 4-9 shows eigenvalues for the first six components, Component 1 is the principle component and will be described in detail.

Component 1, the principle component, which accounts for the most variation, has eigenvalues which fall very closely together on a continuum between 0.15 and 0.35, and are similar across all the variables in the component. This suggests that in the underlying structure of the data, all of the symptoms included in the assessment of depression (with the exception of weight change) are likely important to the construct of depression. The results for Component 1 in Table 4-10 show that eigenvalues cluster into three groups within Component 1, although it is noteworthy that the difference between these clusters is small.

The symptoms with the highest eigenvalues (>0.25) are shown in bold type in Table 4-10 and include disturbances of mood (0.2915), and loss of interest (0.2963), sleep disturbance, including delayed sleep (0.2550) and middle insomnia (0.2773), worthlessness (0.2555), concentration (0.2800) and suicide ideation, including suicidal thoughts (0.3280) and suicidal plans (0.2937).

This first component includes eight variables which represent a set of six depressive symptoms using DSM IV criteria (mood, loss of interest, sleep disturbance, worthlessness,

concentration and suicide ideation). Suicidal ideation has the highest eigenvalue in the principle component, followed closely by mood and loss of interest.

Within this principle component, two further groups of variables are evident. The first group has eigenvalues of >0.20 but ≤ 0.25 , and includes loss of appetite (0.2470), energy (0.2341), retardation (0.2278), guilt (0.2183) and decision-making (0.2063). The second group include the balance of the variables which all fall below eigenvalues of ≤ 0.20 , and are not likely to strongly represent depression in the data. This group includes weight change (-0.0153), early waking (0.1896) hypersomnia (-.01573), agitation (0.1038) and self-harm actions (0.1345).

Table 4-10

Principle components (eigenvectors)

Variable	Component 1	Component 2	Component 3	Component 4	Component 5	Component 6
Mood	0.2915	-0.1505	0.1150	-0.0017	-0.0202	-0.3189
Loss of interest	0.2963	-0.2421	0.0064	0.1636	-0.0084	-0.3379
Loss of appetite	0.2470	-0.2496	0.1879	0.2576	0.1589	0.1892
Weight change	-0.0153	0.3867	0.4181	0.1238	-0.1665	-0.1275
Sleep delayed	0.2550	0.3156	-0.1360	0.1899	-0.0295	0.1273
Middle insomnia	0.2773	0.2402	-0.2178	0.3075	0.1824	0.1913
Early waking	0.1896	0.3933	-0.2358	0.2320	0.3453	-0.0479
Hypersomnia	-0.1573	-0.2071	0.2587	0.2102	0.2608	0.5042
Agitation	0.1038	0.1140	-0.0421	0.4301	-0.4844	0.0748
Retardation	0.2278	0.0224	-0.3139	-0.2580	0.3090	0.1416
Energy	0.2341	-0.3750	0.1975	0.2418	0.1240	0.0795
Worthlessness	0.2555	-0.1544	-0.2518	-0.2102	0.0865	-0.2801
Guilt	0.2183	-0.0510	0.1880	0.1978	-0.0461	-0.2982
Concentration	0.2800	-0.2312	-0.0554	-0.1474	-0.1919	0.2210
Decision-making	0.2063	-0.1356	-0.2621	-0.1179	-0.4476	0.3628
Self-harm thoughts	0.3280	0.1905	0.2737	-0.3006	-0.1051	0.0869
Self-harm plans	0.2937	0.2400	0.3263	-0.3315	-0.0913	0.1814
Self-harm actions	0.1345	0.0752	0.3114	-0.1837	0.3370	0.0502

4.4 The factors associated with depression

In this section the psycho-social data are presented along with results of the analysis of factors associated with depression.

4.4.1 Socio-demographic factors

The results of univariate analysis of socio-demographic variables are shown in column 1 of Table 4-11.

Univariate analysis

The only two socio-demographic variables that were significantly associated with depression were regular income [OR 0.33 (0.15-0.73) $p=.006$] and living in a family homestead [3.09 (1.01-9.54) $p=.049$]. Access to regular income was defined as having access to regular and consistent income either through their own employment or through a regular remittance from a partner, family member or other, but not including government assistance such as a grant. Living in a family homestead included those women who were living in a parental home (either their own or their partners) as opposed to living on their own away from a family network.

While HIV status was associated with depression, it was not significant [OR 1.84 (0.86-3.95) $p=.117$]; however, there was a lack of statistical power to detect the effect of HIV with the limited sample size.

Significant variables from the univariate analysis were entered into the multivariate model using the log likelihood statistic, entering variables from highest log likelihood to lowest.

Multivariate analysis

Multivariate analysis of significant socio-demographic variables with adjusted odds ratios for all the significant variables in the univariate analysis are shown in column 2 of Table 4-11. Women who had access to a regular income were 70% less likely to become depressed [AOR 0.29 (0.13-0.66) $p=.003$]. Women who were not living in a family homestead were almost four times more likely to be depressed than women who were living in a familial or parental home [AOR 3.98 (1.21-13.1) $p=.023$].

Table 4-11

Model 1 Univariate and multivariate analysis of socio-demographic variables

Characteristics	Univariate		Multivariable	
	OR (95% CI)	p value	AOR (95% CI)	p value
Age				
Mean (range)	1.03 (0.96-1.11)	0.458	-	-
Marital status				
Single	1.00			
Married	0.92 (0.23-3.56)	0.883	-	-
Relationship with father				
No	1.00			
Yes	0.64 (0.14-3.00)	0.568	-	-
Missing	0.75 (0.06-8.83)	0.819	-	-
Living with father				
No	1.00			
Yes	0.92 (0.34-2.49)	0.865	-	-
Missing	1.41 (0.57-3.47)	0.454	-	-
Education				
No education	1.00			
Completed Primary education	2.25 (0.60-8.45)	0.230	-	-
Some secondary education	2.50 (0.65-9.65)	0.184	-	-
Completed secondary	2.50 (0.61-10.22)	0.202	-	-
Regular formal income				
No	1.00		1.00	
Yes	0.33 (0.15-0.73)	0.006	0.29 (0.13-0.66)	0.003
Grants				
No	1.00			
Yes	1.44 (0.68-3.09)	0.342	-	-
HIV status				
Negative	1.00			
Positive	1.84 (0.86-3.95)	0.117	-	-
Planned pregnancy				
Planned	1.00			
Unplanned	0.97 (0.37-2.91)	0.963	-	-
Homestead				
Family	1.00			
Non family	3.09 (1.01-9.54)	0.049	3.98 (1.21-13.1)	0.023
Missing	0.32 (0.03-3.00)	0.320	0.35 (0.04-3.48)	0.369
Number of children with father				
First child	1.00			
At least one other	0.71 (0.33-1.51)	0.317	-	-

4.4.2 Social support factors

Table 4-12 shows the results of the social support data for the two types of social support (emotional and practical) measured by social support source. Social support is summarised by depression status.

Most women in this sample reported that their partners and their mothers were their main sources of support. Women reported the highest levels of support from their partners, with 85/109 partners sometimes or always offering emotional support, and 82/109 partners sometimes or always offering practical support. Results show differences in the consistency of social support received from partners, particularly partner emotional support. The differences between sometimes and always receiving emotional support from a partner were quite substantial in comparison to other sources of social support.

More depressed women reported never having received emotional or practical support from their partner than non-depressed women. Depressed women were more likely to respond 'never' or 'sometimes' to most sources of support.

Large numbers of women reported having no father (60/109) and among those who did report having fathers, higher numbers reported never receiving practical or emotional support from them, showing a generalised absence of paternal support figures.

Many women reported having no sibling or friend (60/109), and as a result had very little support from a same or similar aged peer. As shown on Table 4-12, when women did have siblings or friends they were seen to offer higher levels of emotional support as compared to other groups.

Table 4-12

Social support by source, type and depression status

Depression Case	Partner Emotional Support				
	<i>No partner</i>	<i>Never</i>	<i>Sometimes</i>	<i>Always</i>	Total
Depressed	5	8	27	11	51
Not depressed	7	4	23	24	58
Total	12	12	50	35	109
Depression Case	Partner Practical Support				
	<i>No partner</i>	<i>Never</i>	<i>Sometimes</i>	<i>Always</i>	Total
Depressed	5	13	24	9	51
Not depressed	7	3	18	30	58
Total	12	16	42	39	109
Depression Case	Mother Emotional Support				
	<i>No mother</i>	<i>Never</i>	<i>Sometimes</i>	<i>Always</i>	Total
Depressed	14	17	15	5	51
Not depressed	18	14	8	18	58
Total	32	31	23	23	109
Depression Case	Mother Practical Support				
	<i>No mother</i>	<i>Never</i>	<i>Sometimes</i>	<i>Always</i>	Total
Depressed	14	8	17	12	51
Not depressed	18	3	11	26	58
Total	32	11	28	38	109
Depression Case	Father Emotional Support				
	<i>No father</i>	<i>Never</i>	<i>Sometimes</i>	<i>Always</i>	Total
Depressed	26	22	3	0	51
Not depressed	34	17	5	2	58
Total	60	39	8	2	109
Depression Case	Father Practical Support				
	<i>No father</i>	<i>Never</i>	<i>Sometimes</i>	<i>Always</i>	Total
Depressed	26	14	8	3	51
Not depressed	34	7	10	7	58
Total	60	21	18	10	109
Depression Case	Sibling/Friend Emotional Support				
	<i>No sibling/friend</i>	<i>Never</i>	<i>Sometimes</i>	<i>Always</i>	Total
Depressed	31	3	5	12	51
Not depressed	29	3	8	18	58
Total	60	6	13	30	109
Depression Case	Sibling/Friend Practical Support				
	<i>No sibling/friend</i>	<i>Never</i>	<i>Sometimes</i>	<i>Always</i>	Total
Depressed	31	4	10	6	51
Not depressed	29	1	14	14	58
Total	60	5	24	20	109

Table 4-13 shows the results of the univariate analysis of depression and social support in Column 1 and the results of the multivariate analysis in Column 2.

Univariate analysis

In univariate analysis, the absence of practical support from a partner [OR 6.07 (1.11-33.24) $p=.038$] and a father [OR 2.91 (1.04-8.20) $p=.043$] was significantly associated with depression.

Significant variables from the univariate analysis were entered into the multivariate model using the log likelihood statistic, and entering variables from highest log likelihood to lowest.

Multivariate analysis

Social support variables were entered into a multivariable analysis and results showed that 'never' receiving practical support from a partner was no longer associated with depression, but showed a trend [AOR 5.13 (0.91-28.77) $p=.063$].

The significance of 'never' receiving practical support from a father fell away.

Table 4-13

Model 2 *Univariate and multivariate analysis of social support*

Support source and type	Univariate		Multivariable	
	OR (95% CI)	p value	AOR (95% CI)	p value
Partner – emotional				
No partner	1.00			
Never	2.80 (0.53-14.7)	0.224	-	-
Sometimes	1.64 (0.46-5.88)	0.445	-	-
Always	0.64(0.17-2.48)	0.520	-	-
Partner - practical				
No partner	1.00			
Never	6.07 (1.11-33.24)	0.038	5.13 (0.91-28.77)	0.063
Sometimes	1.87(0.51-6.85)	0.347	1.44 (0.36-5.67)	0.600
Always	0.42 (0.11-1.64)	0.214	0.38 (0.09-1.59)	0.186
Mother - emotional				
No partner	1.00			
Never	1.56 (0.58-4.22)	0.380	-	-
Sometimes	2.41 (0.79-7.29)	0.119	-	-
Always	0.36 (0.11-1.20)	0.096	-	-
Mother - practical				
No partner	1.00			
Never	3.43 (0.77-15.36)	0.107	-	-
Sometimes	1.98 (0.71-5.57)	0.192	-	-
Always	0.59 (0.22-1.58)	0.295	-	-
Father - emotional				
No partner	1.00			
Never	1.69 (0.75-3.82)	0.205	-	-
Sometimes	0.78 (0.17-3.59)	0.754	-	-
Always	-	-		
Father - practical				
No partner	1.00			
Never	2.91 (1.04-8.20)	0.043	1.89 (0.57-6.19)	0.290
Sometimes	1.09 (0.38-3.15)	0.876	0.84 (0.26-2.72)	0.782
Always	0.58 (0.14-2.48)	0.465	1.09 (0.22-5.24)	0.909
B/F or sibling - emotional				
No partner	1.00			
Never	0.94 (0.17-5.01)	0.938	-	-
Sometimes	0.58 (0.17-1.99)	0.391	-	-
Always	0.62 (0.26-1.52)	0.298	-	-
B/F or sibling - practical				
No partner	1.00			
Never	3.74 (0.39-35.47)	0.250	-	-
Sometimes	0.67(0.26-1.74)	0.409	-	-
Always	0.40 (0.14-1.18)	0.098	-	-

4.4.3 Socio-demographic and social support factors

Socio-demographic and social support variables found to be significant in univariate analysis in Model 1 and Model 2 were entered into a multivariate model - Model 3.

Multivariate model

Variables were entered in order of log likelihood from highest to lowest: regular income; living arrangements, social support (practical and emotional) from partners and fathers. The results are shown in Table 4-14 below.

Table 4-14

Model 3 Multivariate analysis socio-demographic and social support

Variables	Univariate		Multivariate	
	OR (95% CI)	p value	AOR (95% CI)	p value
<i>Socio-demographics:</i>				
Regular formal income				
No	1.00		1.00	
Yes	0.33 (0.15-0.73)	0.006	0.30 (0.12-0.76)	0.011
Living arrangements				
Family	1.00		1.00	
Non family	3.09 (1.01-9.54)	0.049	6.79 (1.59-28.95)	0.010
Missing	0.32 (0.03-3.00)	0.320	0.22 (0.02-2.72)	0.240
<i>Social support:</i>				
Partner – emotional				
No partner	1.00			
Never	2.80 (0.53-14.7)	0.224	-	
Sometimes	1.64 (0.46-5.88)	0.445	-	
Always	0.64(0.17-2.48)	0.520	-	
Partner – practical				
No partner	1.00			
Never	6.07 (1.11-33.24)	0.038	3.06(0.49-19.26)	0.234
Sometimes	1.87(0.51-6.85)	0.347	0.75(0.16-3.39)	0.704
Always	0.42 (0.11-1.64)	0.214	0.18(0.04-0.90)	0.037
Father – emotional				
No partner	1.00		-	
Never	1.69 (0.75-3.82)	0.205	-	
Sometimes	0.78 (0.17-3.59)	0.754	-	
Always	-	-		
Father – practical				
No partner	1.00		1.00	
Never	2.91 (1.04-8.20)	0.043	1.81 (0.51-6.49)	0.361
Sometimes	1.09 (0.38-3.15)	0.876	0.82(0.22-2.97)	0.757
Always	0.58 (0.14-2.48)	0.465	0.60(0.10-3.59)	0.579

Both regular income and living arrangements were strongly and independently associated with depression. The odds ratios living arrangements increased from AOR 3.98 ($p=0.023$) to AOR 6.79 ($p=0.010$) when social support variables were included in the analysis, even though these variables in themselves were no longer significantly associated with depression.

Access to a regular income was associated with depression, with women who had access to regular income support being 70% less likely to be depressed. Living with family was associated with depression, with women living away from their family home being close to seven times more likely to be depressed.

The results of the final model showed partner social support to be moderately associated with depression, and unlike in the univariate analysis where ‘never’ having practical social support from partner was significant in the multivariate model, ‘always’ having practical social support from a partner was significantly associated with depression [AOR 0.18 (0.04-0.90) $p=.037$]. Women who ‘always’ received practical support from their partners were 80% less likely to be depressed.

Possible interaction effects between regular income support and partner practical supports were explored and are shown in Table A-1 in Appendix G. This analysis suggested that partner practical social support was likely a proxy variable for regular income support, but as shown in Table 4-15 below, the interaction effect was not significant ($p=.256$), however, the numbers are small and the statistical power thus limited.

Table 4-15

Depression, regular income support and partner practical social support

Depression	OR	SE	Z	p	95% CI
Regular income	0.106	0.1114454	-2.14	0.033	0.013-0.831
Partner practical support	0.402	0.1511465	-2.42	0.015	0.193-0.840
Income*Partner practical	1.698	0.792251	1.13	0.256	0.680-4.237

The literature has demonstrated that the relationship of factors associated with depression can differ slightly based on the methodological approach used, in particular among studies which use self-report rather than interview methodology (O’Hara & Swain, 1996). To test this

hypothesis, all the factors included in the socio demographic model and social support model were also explored using logistical regression, however the depression outcome based on the SCID was replaced with the depression outcome as determined by the EPDS10 screening tool, using an overall score (≥ 13) as indicative of depression.

The results show that factors significantly associated with depression on the interview measure (SCID) are somewhat different to risk factors associated with the EPDS10 measure. Using the EPDS measure as an outcome, results showed that living away from a family homestead was no longer significantly associated with depression ($p=.789$), and access to regular income showed a trend ($p=.067$). Never having received partner practical support [OR 8.6 (1.52-49.21) $p=.015$] and being HIV positive [OR 2.27 (1.05-4.93) $p=.037$] were significantly associated with depression in univariate analysis.

When significant risk factors (regular income, partner support and HIV) were entered in multivariate analysis, the results indicated a trend towards a negative association between regular income and depression [OR 0.50 (0.21-1.21) $p=.129$]. Never having received practical support from a partner [OR 5.94 (0.99-35.5) $p=.050$] significantly associated with depression. HIV [OR 2.12 (0.88-5.06) $p=.090$] showed a trend towards associating with depression as measured by the EPDS.

4.5 Screening for depression

This section reports on the performance of the EPDS as a screening tool for the accurate detection of depressive mood.

4.5.1 Sensitivity and specificity

The recommended cut-off for use in clinical settings, a score of equal to or greater than 13 (≥ 13), was considered indicative of depressed mood using the EPDS. Using this cut-off, 48 [44% (34.57-53.50)] of women in the sample screened positive for depressive mood.

The results for depression in this sample using the gold standard SCID (46.8%) and the EPDS (44%) were similar (51:48). The kappa statistic, 0.4638 (agreement 73.39%; expected agreement 50.38% SE 0.095) shows moderate agreement when accounting for chance.

Table 4-16 shows a cross tabulation of women scoring positive for depression using the gold standard SCID compared to the EPDS.

Table 4-16

Sensitivity, specificity and predictive values of the EPDS10

Structured Clinical Interview for Depression			
EPDS10 (13+)	Positive (SCID)	Negative (SCID)	Predictive Value
Positive (EPDS)	35 (true positive)	13 (false positives)	Positive 73%
Negative (EPDS)	16 (false negative)	45 (true negative)	Negative 74%
	Sensitivity 69%	Specificity 78%	

Thirty-five women tested positive for depressive mood on the EPDS and were also diagnosed as having a depression using the SCID (true positives). Thirteen women who screened positive for depressive mood on the EPDS were found not to be depressed on the SCID (false positives). Forty-five women were found to not have depressed mood on the EPDS measure and were also not diagnosed with depression on the SCID (true negatives). Sixteen women scored negative for depressed mood on the EPDS but were found to have depression on the SCID (false negatives).

Using the numbers of true and false positives and true and false negatives, the sensitivity and specificity of the EPDS was calculated. Sensitivity was 69% and specificity was 78%. The EPDS was slightly more accurate at screening out negatives than it was at accurately identifying positives.

The positive predictive value was 73%. The positive predictive value represents the proportion of women with positive test results who are correctly diagnosed, and reflects the probability that a positive test reflects the underlying condition of depression, dependent on prevalence. However, the prevalence of depression in this sample was high, and since positive predictive value is linked to and can be influenced by prevalence, the high prevalence may have increased the predictive value.

The Vassar clinical calculator (<http://faculty.vassar.edu/lowry/clin1.html>) was used to calculate positive and negative likelihood ratios, weighted by prevalence, in order to reduce the influence of the high prevalence rate. Positive likelihood ratios results were LR 2.69 (95% CI 1.6-4.4) and negative likelihood ratios results were LR 0.35 (95% CI 0.2-0.5). Women who scored positive for depressive mood on the EPDS at the ≥ 13 cut off were two and half times more likely to be depressed as women who scored negative. Women who scored negative on the EPDS at the ≥ 13 cut were 65% less likely to be depressed.

4.5.2 Accuracy of cut off points

Table 4-17 summarises the sensitivity and specificity scores for each progressive EPDS cut off point, and illustrates the percentage of women correctly identified and the positive and negative likelihood ratios.

Table 4-17

EPDS cut off points, percentage correctly classified likelihood ratios.

EPDS10 Cut point	Sensitivity (%)	Specificity (%)	Correctly Classified (%)	LR+	LR-
≥ 7	98.04	27.59	60.55	1.35	0.07
≥ 8	98.04	32.76	63.30	1.46	0.06
≥ 9	96.08	37.93	65.14	1.55	0.10
≥ 10	94.12	51.72	71.56	1.95	0.11
≥ 11	82.35	62.07	71.56	2.17	0.28
≥ 12	78.43	67.24	72.48	2.39	0.03
≥ 13	68.63	77.59	73.39	3.06	0.40
≥ 14	58.82	86.21	73.39	4.26	0.47
≥ 15	47.06	87.93	68.81	3.90	0.60
≥ 16	41.18	94.83	69.72	7.90	0.62
≥ 17	35.29	96.55	67.89	10.20	0.67
≥ 18	21.57	96.55	61.47	6.25	0.81
≥ 19	11.76	98.28	57.80	6.82	0.89
≥ 20	7.84	98.28	55.96	4.54	0.93
≥ 21	5.88	98.28	55.05	3.41	0.95
≥ 22	3.92	98.28	54.13	2.27	0.97
≥ 23	1.96	100.00	54.13	0.98	
> 23	0.00	100.00	53.12	1.00	

Table 4-18 shows that the cut-off scores, which maximise the percentage of women correctly classified (at 73.39%), lies between cut off scores of ≥13 and ≥14.

This indicates that the international clinical cut off of ≥13 is also the most accurate cut off for screening for risk of MDE in this sample.

Three other cut points along a continuum from a low ≥10 to high ≥17 are noteworthy, and are extracted and listed in Table 4-18. The full range of scores, across the entire sample, is shown in Appendix H.

Table 4-18

Summary range of significant EPDS cut offs with likelihood ratios

EPDS10 Cut point	Sensitivity (%)	Specificity (%)	Correctly Classified (%)	LR+	LR-
≥ 10	94.12	51.72	71.56	1.95	0.11
≥ 13	68.63	77.59	73.39	3.06	0.40
≥ 14	58.82	86.21	73.39	4.26	0.47
≥ 17	35.29	96.55	67.89	10.20	0.67

Cut off point ≥ 10 : This cut off is commonly used in resource-rich non-clinical settings due to its increased sensitivity. In this sample, using a ≥ 10 cut point identified almost all true positives (94.1%), but only screened out approximately half the true negatives (51.7%). However, it retains a fairly good percentage of correctly classified (71.5%) relative to higher cut off points.

Cut off point ≥ 13 and ≥ 14 : In examining sensitivity, specificity, percentage of women correctly classified and the likelihood ratios together, a cut off of ≥ 14 performs slightly better than a cut off of ≥ 13 . At ≥ 14 there is improved specificity, the percentage correctly classified is maintained at 73.39% and there is an improved LR+ of 4.26 as compared to 3.06 at ≥ 13 . Thus, this cut is more likely to correctly identify absence of depression but is less likely to correctly identify presence of depression.

Cut off point ≥ 17 : At this cut off point almost all the true negatives (96.5%) are correctly screened out, and while only a third (35.2%) true positives are detected, there is very little drop in percentage correctly classified (67.8%) and there is a significant increase in the positive likelihood ratio (LR+) which peaks at 10.20, the highest LR+ of all cut off scores.

4.5.3 Internal consistency

Cronbach's alpha was used to calculate the internal consistency of the EPDS. The alpha statistic will generally increase from 0.000 to 1.000 as the inter-correlations among test items increase, and is thus known as an internal consistency estimate of reliability of test scores.

Because inter-correlations among test items are maximized when all items measure the same construct, Cronbach's alpha is widely believed to indirectly indicate the degree to which a set of items measures a single one-dimensional latent construct, in this case depression. The alpha statistic is most appropriately used when the items measure different substantive areas within a single construct, as is the case with depressed mood and the EPDS (Cronbach & Shavelson, 2004).

Cronbach's alpha statistic for the EPDS in this sample was 0.6130, indicating that while the performance of the EPDS was fair and that it likely identified the construct of depression, it fell short of the general standard (≥ 0.70) guideline for a standalone screening tool.

4.5.4 Item analysis

Table 4-19 shows the results of the regression analysis of individual items of the EPDS against the SCID depression outcome. In univariate analysis, five items were significant at $p < 0.001$ level.

These were:

- The EPDS 2 “no longer looking forward to things”
- EPDS 7 “so unhappy I have had difficulty sleeping”
- EPDS 8 “I have felt sad and miserable”
- EPDS 9 “I have been so unhappy I have been crying” and
- EPDS 10 “the thought of harming myself has occurred to me”.

Table 4-19

Univariate and multivariable analysis of depression and EPDS items

	Univariate		Multivariable	
	OR	P value	AOR	P value
EPDS 1	1.59 (1.04-2.41)	0.029	-	-
EPDS 2	2.32 (1.50-3.60)	<0.001	1.79 (1.08-2.98)	0.024
EPDS 3	1.3 (0.90-1.92)	0.152	-	-
EPDS 4	0.64 (0.42-0.97)	0.035	-	-
EPDS 5	1.62 (1.08-2.42)	0.019	-	-
EPDS 6	1.06 (0.74-1.51)	0.733	-	-
EPDS 7	2.14 (1.4-3.27)	<0.001	1.07 (0.59-1.94)	0.812
EPDS 8	2.42 (1.59-3.70)	<0.001	1.46 (0.85-2.52)	0.166
EPDS 9	4.04 (2.29-7.12)	<0.001	2.31 (1.19-4.51)	0.013
EPDS 10	3.07 (1.73-5.44)	<0.001	1.86 (0.99-3.46)	0.051

Entering only the five significant items from univariate analysis into a reliability analysis resulted in an improved adjusted alpha statistic of 0.7501, suggesting that these five items had better inter-item correlations and were more likely to reliably measure the underlying construct of depression than the full EPDS 10 item screening tool.

When these five items were entered into a multivariate analysis, the items with significant relationships with a diagnosis of depression were items:

- EPDS 2 “no longer looking forward to things”
- EPDS 9 “I have been so unhappy I have been crying”
- EPDS 10 “the thought of harming myself has occurred to me”

4.5.5 ROC analysis

Four versions of the EPDS were tested for sensitivity and specificity using ROC analysis.

The first version included in the analysis was the full ten item EPDS labelled EPDS10 and identified in blue on the ROC graph.

The second version included was the traditional 7 item depression subscale labelled EPDS7 and is identified in green on the ROC graph.

The third version of the EPDS included was the traditional 3 item anxiety subscale labelled the EPDS3 and is identified in red on the ROC graph.

The fourth version included was a new subscale developed on the basis of item regression analysis results which included items 2, 9 and 10 and labelled EPDS-Zulu and identified in orange.

The ROC analysis output graph in Figure 4-4 below maps the performance of each of the four versions of the EPDS for sensitivity and specificity against the gold standard.

The results of ROC analysis show that the 7 item depression subscale EPDS7 with a ROC area of 0.8323 performs significantly better than the full item EPDS10 with an ROC 0.7311.

The 3 item anxiety subscale performs poorly with a ROC area of 0.5494.

The new 3 item EPDS-Zulu performance improves, although only marginally so, on the performance of the EPDS 7, with a ROC area of 0.8396.

However, given that it is a 3 item version, its relative performance is substantial as it allows for use of four fewer items with a gain of 0.0073 in ROC area.

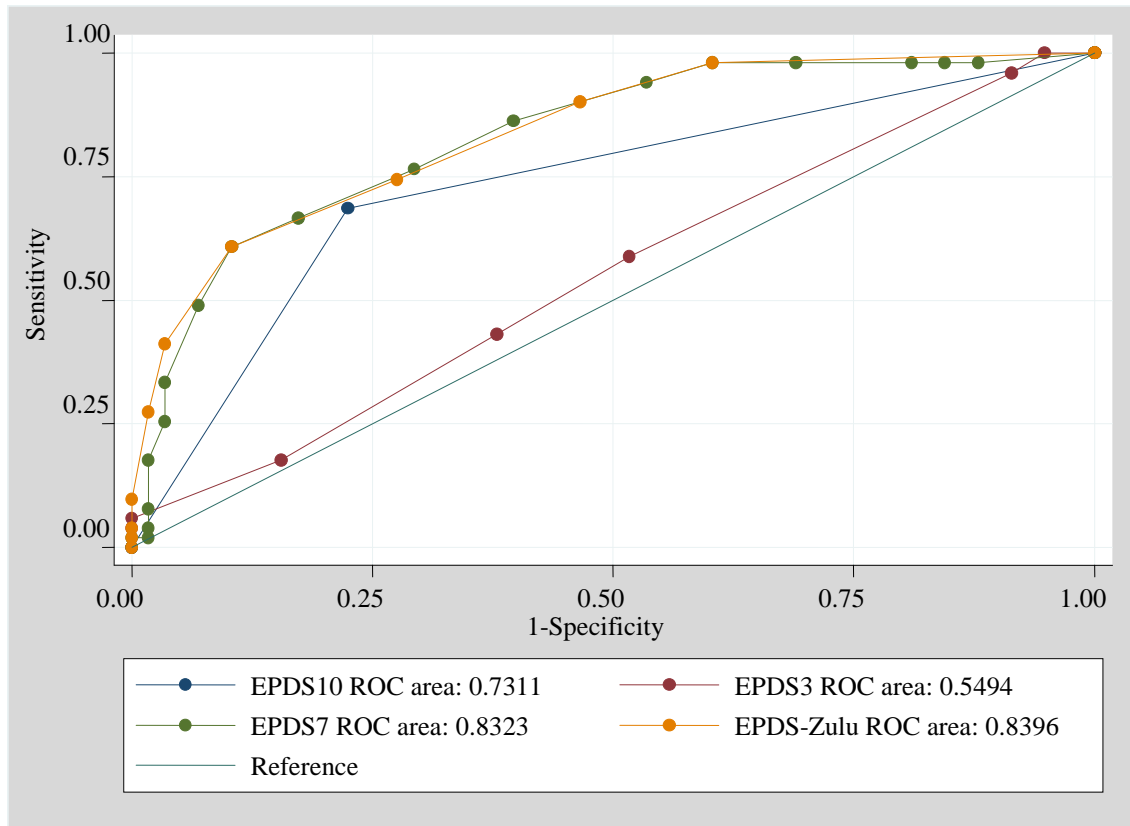


Figure 4-4 ROC analysis of four versions of the EPDS

4.6 Qualitative results on women's experiences of pregnancy

This section of the chapter reports the results of the qualitative interviews undertaken to explore women's experiences of their pregnancies and their experience of testing for HIV. Unlike with quantitative research, qualitative results are presented with a level of interpretation inherent in the description of results. The section begins a brief overview of the characteristics of the women included in the qualitative sub-sample. Following this, results are presented by group, along with summaries of the three main thematic areas in which some discussion points are highlighted by group. Interpretation and discussion of issues across the four groups is expanded upon in the discussion section.

Thereafter the qualitative data is presented, data is organised into four groups of women by their pregnancy orientation (planned/unplanned) and HIV status (positive/negative). For each group, the results focus on three thematic areas: data around two narrative events: the experience of pregnancy and the experience of HIV testing are described.

4.6.1 Qualitative sub-sample characteristics

Sixty women completed the qualitative interviews; of these, four interview transcripts were excluded (two interviews with HIV positive and two interviews with HIV negative women) as a result of poor audio quality or technical failures during data collection which rendered the interviews unusable. Fifty-six tape recorded interviews were successfully transcribed and included in the data analysis. The women in the qualitative sub-sample by HIV and depression status are illustrated in Figure 4-5.

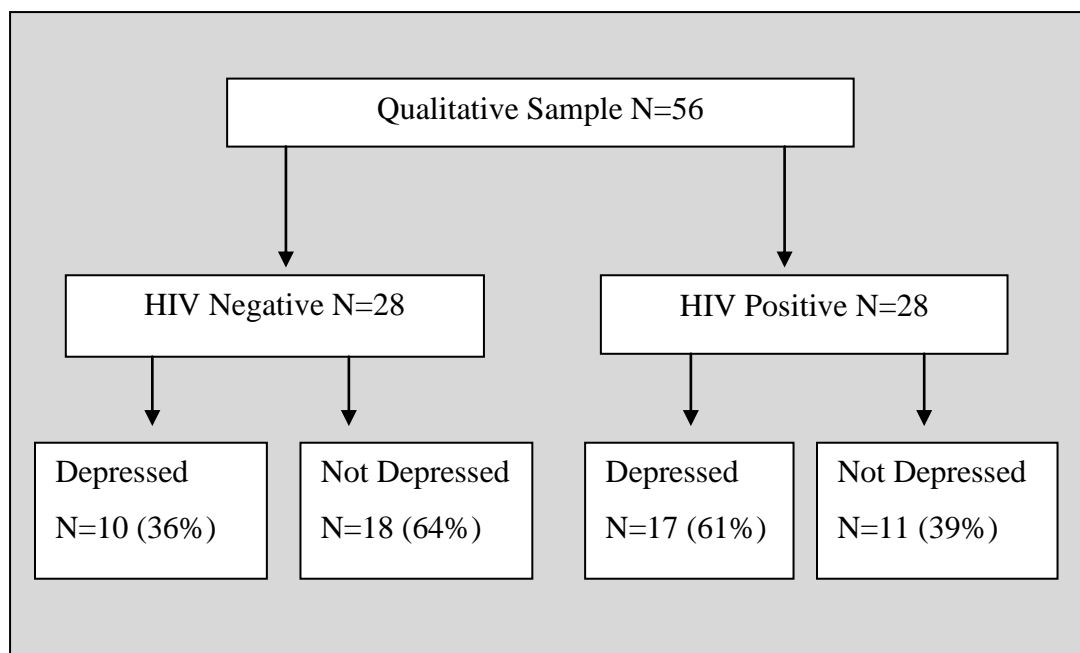


Figure 4-5 Qualitative sub-samples with HIV and depression status sub-groups

The women in the qualitative sample were similar to the larger sample of 109 in socio-demographic characteristics. Sample characteristics for the sub-sample are displayed in Table 4-20, alongside characteristics of the larger sample, illustrating that women in the sub-sample were representative of the main sample.

Twenty two of the 56 women (39%) were receiving a regular income, and among the women receiving an income six (11%) reported it to be their own income 11 (20%) were receiving regular income from their partner, 1 (2%) her mother, 3 (6%) from their fathers. These characteristics were similar to those of the larger sample.

Forty six women were living in their family homestead, while nine women were living separately from their family of origin. Of the nine women not living with their own families, three were living together with their partner away from any family, two were living with their partner at the partner's family homestead, and three were living on their own away from their or their partner's family, and one woman had missing data for living circumstances. Once again, these characteristics were similar to those in the larger sample.

Table 4-20

Sample characteristics of main and qualitative sub-sample

Characteristics of participants	N (109)	Main sample Percentage	N (56)	Sub-sample Percentage
Age				
Median	24.6			24.6
Range	16-40			16-39
Education				
No education	14	12.8 %	5	8.9%
Completed Primary education	38	34.9 %	21	37.6%
Some secondary education	32	29.4 %	12	21.4%
Completed secondary	25	22.9 %	18	32.1%
Marital status				
Unmarried	100	91.7 %	51	91.1%
Married	9	8.3 %	5	8.9%
In stable relationship with partner				
Yes	98	89.9 %	56	100%
No	7	6.4 %	0	-
Missing	4	3.7 %	0	-
Cohabiting with father				
Yes	21	19.2 %	6	10.7%
No	60	55.1 %	50	89.3%
Missing	28	25.7 %	0	-
Number of children with father				
First child	57	52.3 %	28	50.0%
At least one other	52	47.7 %	28	50.0%
Living arrangements				
Family	87	79.8 %	46	82.1%
Non Family	17	15.6 %	9	16.1%
Missing	5	4.6 %	1	1.8%
Regular income				
Yes	54	49.5 %	22	39.3%
No	55	50.5 %	34	60.7%

Only 15/109 women had a planned pregnancy in the larger sample of women. In the sub-sample 10/56 women reported having planned the pregnancy, and 46 reported an unplanned pregnancy, ensuring adequate representation of issues related to both planned and unplanned pregnancies in the smaller sub-sample. Of the 10 women who reported a planned pregnancy, five were HIV positive and five were HIV negative.

In the qualitative sub-sample, the rate of depression was slightly higher (52% CI 38 – 65) than in the larger sample of 109 women, although not significantly so. Seventeen (61%) of the 28 HIV positive women were depressed, while 11 (36%) were not depressed. Ten (36%) of the HIV negative women were depressed while 18 (64%) were not depressed.

4.6.2 The narrative structure

The results of the analysis of the narrative structure within the data set found a common plot structure across all narratives. However, it is likely the narrative structure was partly the result of the storyline inherent in the structure and order of the interview guide, which was augmented by women's narrative responses.

The interview guide, although developed to be broad and open-ended, was structured to draw narrative attention to specific areas of the plot, most particularly the experience of the pregnancy and HIV testing. In traditional narrative approaches, the narrative interview guide may have been more restricted in prompting and framing the importance of specific aspects of stories, and in such instances, women may have raised other issues more salient to their lives as lived, which might have fallen outside of the pregnancy and HIV narrative.

The degree of uniformity in the narrative structure may also have been influenced by others factors, firstly, that qualitative interviews took place directly after the SCID, a structured interview, and both interviewers and women may have been more orientated to structure than they would have been if only a qualitative approach had been used. Secondly, the rapport already established, and the degree of knowledge of the interviewer regarding the goals of the assessment and qualitative interview may have resulted in some co-construction of narratives to meet the research goal. Results should be viewed and interpreted with these limitations in mind.

The common narrative structure began with relating the story of the discovery of the pregnancy, as prompted by the interview guide; analysis found that women's narratives fell into two distinct groups in terms of narrative plot orientation as either a *planned* or an *unplanned* pregnancy. For quantitative analysis purposes, the pregnancy being planned or unplanned was determined objectively on the women's initial description of the pregnancy in the preceding quantitative socio-demographic questionnaire, and was thus a predefined category which could be used to organise narratives. For all women in the sub-sample, without exception, the construct

of planned or unplanned was also used naturally at the onset of each narrative as a way to provide orientation on which the emerging narrative could rest. There was 100% concordance between the reporting of the pregnancy as planned or unplanned on the quantitative questionnaire and how the women presented her narrative orientation in the qualitative interview. As such, the planned unplanned pregnancy became the orientation and normative starting point for organising the narrative structures.

Since unplanned pregnancies were very common in the sample, further narrative analysis illustrated distinctions regarding women's feelings about the pregnancy and how they were coping with and were able to resolve their feelings about the pregnancy at the time of the interview. While pregnancies may have initially been described as planned or unplanned, at a second and deeper level, accessed only during the qualitative interview, women had either resolved the pregnancy as *wanted* or *unwanted*, and whether the pregnancy was currently wanted or unwanted was closely related to the women's evaluation of her experience of pregnancy support and their HIV testing outcomes.

In the first narrative element all women focused on two main thematic areas which shaped their feelings about the pregnancy and which determined whether it was considered a wanted or unwanted pregnancy, prior to HIV testing. These two themes were their partner and family responses to the pregnancy. In the evaluation of partner and family support in response to the pregnancy, several sub-themes played an important role: partner specific sub-themes included feelings related to the rejection, abandonment and the loss of romantic love, fears of infidelity, particularly in terms of stories about partner responses to the pregnancy and HIV testing. Family sub-themes included the social acceptability of the partnership and pregnancy, socio-economic stressors and sources of practical support towards child care. The resolution of this first part of the plot was the pregnancy being *wanted* or *unwanted* at the point of entry into HIV testing, regardless of whether it was initially planned or unplanned.

The middle of the common narrative plot featured the HIV testing event and the discovery of HIV status, and the women's interpretation of the meaning of the HIV diagnosis in her life and her pregnancy. All women in this sample had tested for HIV as part of their antenatal care and had learnt their HIV status (either positive or negative) for the first time between 2 and 4 weeks before the qualitative interview. The HIV testing event gave rise to a specific

interpretation by the narrator of the meaning of the HIV event to the pregnancy which either served to confirm the story of a wanted or unwanted pregnancy or created a twist in the storyline which shifted the feelings about the pregnancy from wanted to unwanted or vice-versa.

This was followed by the ending of the plot, where resolution was brought by drawing together plot elements such as partner and family support and HIV testing experience/outcome to determine a final resolution of a wanted or unwanted pregnancy. In some, but not all instances, coda (clauses that brought the narrative back to the time of telling, to the *what happens now* context of everyday lived experience) emerged in how women related their HIV diagnosis to everyday life, either through reproductive health planning, their perception of health risk behaviours or through prevention of mother to child transmission coda among HIV positive women.

An overview of this common narrative structure is illustrated in figure 4.5 below.

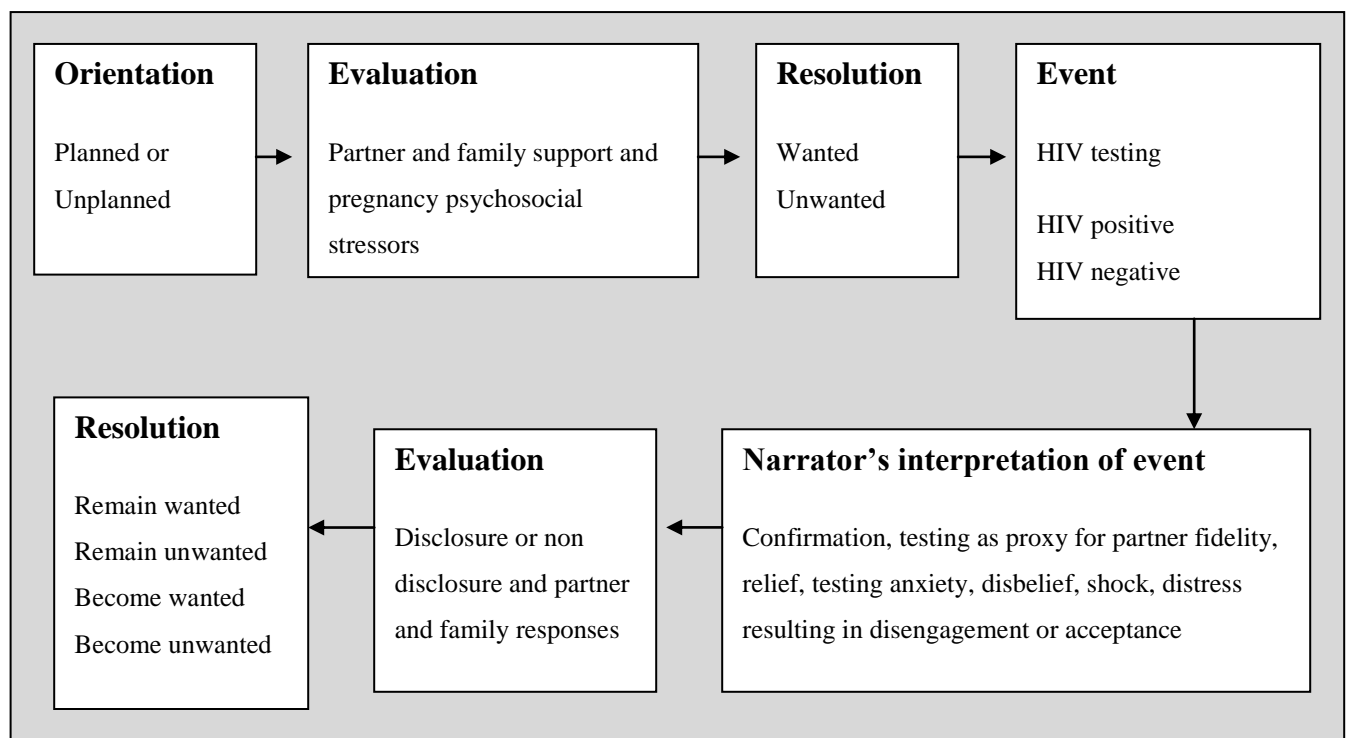


Figure 4-5 Outline of the narrative structure

4.6.3 The plot orientation: Planned versus unplanned pregnancies

Women who planned their pregnancy were significantly less distressed by the pregnancy itself at the onset of pregnancy, but among these 10 women, significant stressors during the pregnancy (including testing HIV positive for five of the ten women) in many cases shifted feelings about whether the pregnancy was currently wanted for unwanted.

The larger group of 46 women had unplanned pregnancies which introduced significant stresses and required significant adjustment. Women's adjustment to and ability to cope with the unplanned pregnancy was mediated by their experiences of their partnerships, their familial support and socio economic status, and later in their narratives, their experience of learning their HIV status.

Given that the planned/unplanned and wanted/unwanted represented both organisational categories and thematic categories for how women presented their narratives, and since the HIV result was the variable that most strongly influenced the direction of the narrative, these categories represented a natural grouping by which data could be organised and presented. These categories are thus used in the presentation of the data in the rest of this section.

4.6.4 The four narrative groups

As indicated above, the 56 narratives were grouped by one of two common orientations: either a planned (10) or an unplanned (46) pregnancies at the beginning of each story. At the midpoint, during the resolution of the pregnancy narrative prior to testing for HIV, 22 women (7/10 planned and 27/46 unplanned pregnancies) reported *wanted* pregnancies, and 34 (3/7 planned and 19/46 unplanned) women reported *unwanted* pregnancies.

The HIV event further split the two groups of stories into four groups based on either an HIV negative or HIV positive outcome. The four groups included women who had:

- A planned pregnancy and had tested HIV negative (N=5/10)
- An unplanned pregnancy and had tested HIV negative (N=23/46)
- A planned pregnancy and had tested HIV positive (N=5/10)
- An unplanned pregnancy and had tested HIV positive (N=23/46)

After HIV testing, the number of women with wanted pregnancies reduced to 12/46 and the number of women with unwanted pregnancies increased to 44/56. This shift was mainly accounted for by women who subsequently tested HIV positive, and thus felt that they no longer wanted the pregnancy given their HIV positive status.

Each of the four narrative groups are outlined below with the main and sub-thematic areas, narrative patterns and quotations provided to support analytic findings.

In each group, a summary or patterns of stories is presented at the beginning of the discussion of the group, outlining the common themes, the resolution of a wanted or unwanted pregnancy at the narrative midpoint assessment (prior to HIV testing), and again after the HIV testing. This provides a ‘snapshot’ in a narrative findings before the narrative is discussed in further detail in the text.

Data is presented in group by HIV status and by whether the pregnancy was planned or unplanned. As such groups are presented in the following order:

- Planned HIV negative women
- Unplanned HIV negative women
- Planned HIV positive women
- Unplanned HIV positive women

Interpretation of patterns in the narrative data is limited in the results section and is expanded upon in the discussion.

4.6.5 Group 1: Planned pregnancies among women who tested HIV negative

In this group of five women, three women’s narratives were relatively similar, while two were more distinctive. Three women related that the pregnancy was planned; that they had good partner and family support and that their pregnancies were wanted. One woman related that while the pregnancy was wanted, she was having difficulties in her intimate relationship which she attributed to the pregnancy, and HIV testing had worsened these feelings. One woman reported that while the pregnancy was planned, neither her partner nor her family were supportive, and as a result she had an unwanted pregnancy.

4.6.5.1 Wanted versus unwanted pregnancies

Three of the five women related similar and fairly contented narratives around the pregnancy, their partner's response and family support, and as a consequence of these factors, reported a wanted pregnancy. These women were generally less concerned with socio-economic stressors and reported being comfortable in their intimate partnerships, and that they were looking forward to the birth of their babies. These three women expressed worries about their pregnancy and their ability to cope with the baby, but these reflected normal pregnancy-related concerns:

"I was a bit worried in the beginning, I used to imagine what if he cries a lot or doesn't want to sleep and about how I can take care of him properly as I don't have a job yet, but then I know I must have confidence in myself, that I can do this, and I was okay, and now I am even happy" (P6)

A fourth woman who reported wanting the pregnancy did raise concerns about the changes the pregnancy had brought about in her relationship with her partner, and related that this had been similar during previous pregnancies. This woman was also diagnosed with depression:

"I feel hurt because my partner doesn't come home sometimes, and he is not really supportive...it was like this with my other babies, he will start doing these things, he just leaves me by myself and I don't know where he goes, he does not support me with love [becomes tearful] he doesn't even pretend [tearful] since I was pregnant I think maybe he has found a new girlfriend" (P38)

One woman in this group of five reported an unwanted pregnancy because she had experienced partner and family conflict as a result of and in response to the pregnancy. She reported feeling isolated and was no longer feeling comfortable with the pregnancy. This woman was also diagnosed with depression:

"We planned it but since there has been an argument with my partner, about 'inhlawulo' the damages he must pay to my family because he made me pregnant, so this pregnancy has caused big problems in our relationship and in the family, and I don't want this baby anymore" (P24)

4.6.5.2 HIV testing

The process of and need for HIV testing during pregnancy was stressful for this group of women, but not a particularly negative life event. Women felt concerned about testing prior to testing because while they had wanted to, they didn't feel sure that they could trust their partner. In this group, 3/5 women who had reported a wanted pregnancy and partnership support interpreted their HIV negative status as a confirmation of the expectation that they were HIV negative, and said that it had instilled further confidence in their relationships with their partners:

"I didn't know if I had it, and I was worried because I got pregnant, there is nobody who can be pregnant and not worry about it, so that day you have to test is very difficult, you start to worry that your man has been going with other women you don't know about, you just want to run away, so I am happy to know I don't have HIV" (P18)

These three women reported disclosing their HIV status to their partners, and that the response had been generally positive, although their partners had been surprised that they had been tested:

"I told my partner; he was happy, but maybe a little bit shocked that I had tested" (P30)

The one woman who was having partnership difficulties related significant distress around testing, even though she had tested negative. This woman was less concerned about partner trust issues and more concerned with the possible consequences for the baby, and the reality of the risk of HIV that she had had to face up to when she was tested. As a result of levels of distress, she had not felt ready to disclose to anybody as yet:

"I was worried that I might be positive and that because of that the baby might be positive, since the virus is very famous now, it is well known, I worried that I could be positive and what a problem that would be, if I had been positive I would have been so preoccupied with the thought of being positive, but now I am free because I know I am going to have a good baby, it changed how I felt because if I was positive I would have even thought about killing myself...I haven't told anyone, because I don't feel ready to talk about it yet" (P38)

HIV testing concerned this woman to such an extent that while she had initially felt she wanted the pregnancy, after testing, she felt more preoccupied with her health. Furthermore, in the light of her partner inattentiveness, she had begun to feel ambivalent about the pregnancy.

For the one woman who had initially planned the pregnancy but subsequently had an unwanted pregnancy as a result of poor partner and family support and partner and family conflict, her HIV negative test was a relief and presented her with one less matter to worry about, however, the pregnancy remained unwanted. This same woman, while feeling some relief over being HIV negative, did not disclose her status to her partner or family. This woman also had a diagnosis of depression:

“When they told me I was HIV negative it changed my feelings because before that I was scared because I thought I had the virus, now I am happy to know that I do not have it but for now it doesn’t really help my problems to know that I am HIV negative” (P24)

4.6.5.3 Prevention and health risk behaviours

One of the three women who had a wanted pregnancy and good partner support also felt that this was an opportunity to engage with her partner on safe sexual practices in the future:

“I know now that even after I get my baby it is important to maintain my good behaviour such as to abstain or to keep condomising and my partner knows this also” (P6)

4.6.6 Group 2: Unplanned pregnancies among women who tested HIV negative

In this group of 23 women who reported having unplanned pregnancies, the majority (16/23) reported that the pregnancy was wanted despite being unplanned. HIV testing did not influence whether the pregnancy was wanted or unwanted with the same women reporting a pregnancy as wanted or unwanted before and after HIV testing. Women with unplanned, unwanted pregnancies also tended to also have depression (5/7) as compared to those with unplanned wanted pregnancies (2/16). More than half the women (13/23) in this group responded to their HIV testing with confidence and disclosed to either their partner (5/13) or family (4/13), while 2/13 did not disclose. Women with unsupportive partners (10/23) tended to respond to their HIV negative test with relief, and half of those women (5/10) did not disclose to anyone,

while the other half disclosed only to their families. Two of these women, while feeling relief, were also distressed to learn about the window period.

4.6.6.1 Wanted versus unwanted pregnancies

Women with unplanned but wanted pregnancies (16/23) were less distressed by the pregnancy and were also less likely to be depressed. Among 11/16 (47.8%) of women with unplanned but wanted pregnancies, narratives illustrated that the initial distress over unplanned pregnancies had dissipated as a result of positive factors such as supportive partnerships, positive self-esteem and coping skills:

“It was a bit of a shock at first, but there has not been too many difficulties and I feel good, I think it will be a beautiful baby like its mother (laughs) I can’t wait to see the baby and hold it, it will be better if it’s a girl because I already have a boy, she is already playing in my tummy you know, I can feel it, so there is nothing much that is worrying me because the grandmother of the child will help me to take care of the little ones and even financially my partner gives me money, so everything is fine at home” (P13)

The support of their family network was also critical to women’s sense that they could cope with the unplanned pregnancy:

“Even though it was not planned it hasn’t been bad, my grandmother is there for me and my parents they will help with the baby, and my partner has said that his mother and his grandmother will help too, I just worry that if I get work I will have to be away from the baby and that will hurt, I would want to stay with him” (P46)

Family support was frequently closely related to good relationships with maternal figures, including mothers and grandmothers:

“When I found out it was not great, because I didn’t plan it, but I am feeling okay, the child will be okay because the father is working, I will look after the baby, I will not go back to school, but it’s okay, the baby can be raised under its mothers hand...we live with my grandmother, but my mother and my grandmother are not working, so they can also help and support me and show me how to look after the baby, because the father is providing, so I don’t see that I need to be

worried about the baby, I do not have thoughts that I will not be able to handle the baby, because I have people who will support me” (P2)

A smaller group of women with wanted pregnancies (4/16) related that the pregnancy had introduced significant partnership difficulties and conflict, but that as a result of family support and care the pregnancy was still wanted:

“My partner has been causing a lot of problems since my pregnancy, he has other girls and he is drinking and not coming home, my family wants me to leave him alone, because he has not been good, they say they will take care of me, even though he is still hurting me now, I won’t let him push me under” (P14)

In one distinct case a woman explained that she had a good supportive relationship with her partner but that family support was limited due to conflict with her mother over her relationship with her partner. Despite this lack of family support, the pregnancy was considered wanted, in particular since the partner was emotionally and financially supportive, as were extended family that lived in Cape Town:

“My mother is very difficult with my partner so I am glad he still manages to stay around, things are difficult with my mother, besides that she doesn’t like my partner, she lost some money and she said it was me and starting saying things that hurt me...being in this situation, the way my mother and I are does not satisfy me and that worries me...I want to go and live with my grandmother in Cape Town, if I can find a way to go there, she raised me and I can stay there nicely with my children even if it is far away from my partner he says he can visit and the problems with my mother will be less.” (P22)

Women with unplanned unwanted pregnancies (7/23) were more distressed by the circumstances of their pregnancies, had little or no partner and family support, and were frequently depressed (5/7). Several of the unplanned and unwanted pregnancies in this group were clustered among women aged 16 to 19 years; and thus, many of these first time mothers were particularly distressed by the impact of the teenage pregnancy on family and the partnership:

“I feel trapped, I think about the future and about not being able to go anywhere at any time because of the baby, I’m just not prepared for this child, I don’t want it and I don’t know if I am going to be able to do things for it like I am supposed to” (P34)

“This pregnancy has not been good, I was not ready for it and my parents were disappointed about my pregnancy, they didn’t expect it and they were very hurt, they ended up having to accept it but things are not the same with us anymore... more especially knowing that I have hurt my parents” (P31)

The remaining women were concerned that their unplanned pregnancy was a regrettable mistake because the it followed too soon after another child, or for other reasons:

“This pregnancy was a big mistake, because I am still under my parents, I am not independent, I am not yet married, so this baby was a mistake so I can say that I am worried about myself, I wished that I could continue schooling and become something but that never happened because I came across the problem of finding myself pregnant with the first baby [becomes tearful] I have not felt right since that first child and now I have made the same mistake again, now it is worse and my family will not help me this time, you can’t expect that when you make the same mistake again” (P12)

One woman reported that while her partner was supportive, her family was not, and that her lack of trust in her partner had resulted in her not wanting this pregnancy:

“For now he is supporting me, but I don’t trust him, maybe he will change after the baby is born and find other women” (P30)

Similarly, all seven women in this group of unwanted pregnancies cited experience or concerns with abandonment or fears of rejection from their partners, which strongly influenced the feelings about the pregnancy:

“My partner just left me like that, when I was four months pregnant, he just disappeared and I haven’t seen him, he hasn’t called or anything” (P1)

“I used to think about my partner and that maybe he will run away because I am pregnant, I am scared of that because most of the time boys do so and go for those girls who are not pregnant” (P19)

“Since I was pregnant he has found a new girlfriend...and there is no money because he has to divide it to this new family as well and now we are suffering” (P5)

The pregnancy had also resulted in significant partnership conflict for 7/10 women who cited unplanned pregnancies with unsupportive partners:

“I have been fighting with my partner and being pregnant is the reason, I feel hurt and when we fight all these bad feelings and thoughts come” (P54)

The hurt and rejection from partners was amplified by family rejection and anger over the pregnancy:

“It’s really not been good, my family have chased me, I have lost my family because of this mistake, my mother has been hurt by this she shouts at me and it hurts me, it is difficult, I feel very sad, I wish the pregnancy was not true, maybe when the baby comes I will believe it, I don’t have anybody to support me and I worry that I will not be able to have everything the baby will need” (P23)

Cultural norms around the father of the child and the paternal family taking responsibility for the cost of caring for a child strongly mediated whether some women’s families of origin would offer mother and baby support. This was cause for distress for women as it was most common in narratives where the partner was either less accepted by the family, or where he had abandoned the woman as a result of the pregnancy, that women would be forced to seek support from their own families. These women were often ostracised by their families because it was expected that the paternal family should take responsibility, and frequently felt significant isolation as a result:

“It has been difficult right from the beginning of this pregnancy, the situation at home with my uncle was not good, they were chasing me away and shouting at me saying I should go to where I got this baby from, that they don’t want me (becomes tearful) they are very disappointed in me (tearful) the partners granny has said she will try to help but it hurts a lot that my family is

chasing me, I don't even know where I will go after the delivery, I don't have a home, my parents are passed so I had to stay with my uncle and I don't have a home" (P1)

This practice also frequently meant they would have to be separated from their babies:

"The baby will have to stay with the partners family, it can stay there because they can help while I try to get work, I don't want that but I have to trust them because I don't think my family will help, they will say his family must do it" (P2)

For most of these women (6/7) the absence of partner and family support introduced significant concern around providing for the child, and these salient financial concerns contributed strongly to the pregnancy being unwanted:

"I worry about the finances...the expenses I am going to have...the baby of the father is around but he is unemployed so he has no money to help" (P30)

Not being able to provide for the baby caused significant emotional distress, guilt and shame.

4.6.6.2 HIV testing

The majority (13/23) of women were nervous but relatively confident about HIV testing and testing HIV negative was a confirmation of their expected result. A few of these women had felt anxious prior to testing and acknowledged that they were at risk, and should have been more proactive about protecting their health prior to testing:

"I was wondering if I was positive since I am pregnant" (P22)

"I used to worry about whether I was HIV positive, even more than I worried about what my family would say about me being pregnant, but then I tested and I was so happy because I am negative, now I look after myself and that the baby will be safe" (P3)

Most had chosen to disclose their HIV test and negative status to their partner and felt the HIV negative test was in some way a confirmation of their partner's fidelity and honesty:

“I told my partner, he was happy, but he was surprised that I had tested just like that without him, but for the result he was not surprised because he has tested before and he knew he was negative and we have been together some time now” (P15)

Women expressed some naivety that the negative status was a static concept and narratives illustrated some, but very limited recognition of possible future risk. This future optimism was present despite salient themes of partner infidelity and expressions of a lack of trust:

“I found out for now that I am negative, like I know that for now my partner is not cheating and I was worried about my status, so now I know that I can be happy about it, but I also know that it can change” (P12)

“It did happen that I thought maybe I should not ever break up with this partner because I might find a man with the virus, but I suppose if we break up and I find another one, I could ask that one to test first”(P22)

The balance of the women (10/23) had already related partnership problems prior to HIV testing and expressed relief that they had tested HIV negative; in particular, relief was focused on the baby being safe from HIV, as these women had felt particularly exposed given their partners' behaviour towards them since the pregnancy.

Of these 10 women, five chose not to disclose to anybody and did not see any reason to, while four had disclosed to their families who were their main support and who had been relieved and happy for them given that that partner had been unsupportive. One woman who had no partner or family support had told her family about her HIV negative status in the hopes that it would redeem her for becoming pregnant, but her family had expressed disbelief at her status:

“They said they didn't believe me, they see me as naughty now because I got pregnant so they don't believe I am telling the truth, they said I was lying”(P4)

Two women were anxious, having learnt about the window period, and were not able to fully accept their HIV negative status as a result:

“I was happy that they said I was HIV negative, but I know I still have to come back because I could be in a the window period, they explained that, so I am not completely relieved as yet... but I knew at least now I can look after myself, make sure I don’t get it, that is if it turns out I don’t have it” (P1)

“They said I was negative, but that I might be in the window period, so I have to come back again to check, I was happy, but only half, as I said they told me I might be in the window period, so I could only be a little happy, but I also felt nervous that maybe if I was they wouldn’t tell me for sure because I am pregnant, as I think being HIV positive can’t be good for any pregnant woman, I will feel better after the second test at 32 weeks, then I will know for sure” ” (P19)

4.6.6.3 Prevention and health risk behaviours

Despite concern over the unplanned pregnancy many women expressed a lack of autonomy over their reproductive health choices, and there was a degree of naivety about the implications of unprotected sex:

“My husband and I had agreed that we would not have any more children, right now he thinks this baby that I am pregnant with is not his, we were using a condom and he burst it now he doesn’t want to own up to what he did, but I knew he burst it because I saw that I was wet, it didn’t come off, so when I asked him he said he doesn’t know what happened” (P42)

“The pregnancy was a mistake, we were condomising and the condom broke and I did not get help, I didn’t get the 24 hour pill as I should have, the morning after one, I didn’t think anything would really happen” (P22)

However, a few women felt that learning their HIV status during pregnancy had empowered them to reduce their health risks, in particular since the baby’s health was at stake:

“I was happy about my status, like now I can talk to my partner, because men they don’t like to have just one partner at a time, so that’s why I could say I’m happy now that I am negative and he must use condoms” (P51)

“I told my partner and I encouraged him to come and test as well because I could be in the window period and he said he will come and check as well, to be sure the baby is safe”(P55)

Women related some stigma around HIV status, and that these fears of rejection played a role in how they had disengaged with prevention prior to testing during pregnancy:

“My feelings changed after I realised I was HIV negative, I was relieved because I felt I can stay with other people, like my friends because if you have the virus your friends run away, they leave you, so I am happy this has not happened to me, that fear is what made me not want to know before, because if I was positive I would be so worried people would know, they would see, but now I am glad to have tested and I can be free” (P13)

“Yes, like I used to say to myself I should go and check but I don’t, so in a way being pregnant helped so now I know and I can encourage others to test, and I see how important it is to test, but maybe I can’t tell people that because they will say that I am only saying it because I am negative” (P45)

Two women expressed that they did not feel comfortable to disclose to their partner that they had tested for HIV, as they were fearful of what the reaction would be, and whether it would stigmatise them. In both instances there had been previous discussion about HIV testing and the partners had refused to test. These women were slightly concerned about their partner resistance to testing:

“I have asked him to come but he keeps saying he is busy, he does not have time for that and why don’t I trust him, maybe I could tell him there are people here who want to talk to him about the baby, then he might come, he doesn’t understand it is because I am worried for the baby, but if you tell him he has to test, just for no reason to know, no he will not come, but if it’s about the baby then I know he will come but when he finds out it is to test he will be angry at me for not trusting him because he says he does not have it” (P56)

4.6.7 Group 3: Planned pregnancies among women who tested HIV positive

In this group of women the partnerships theme featured strongly, and less focus was placed on family or psychosocial stressors unrelated to partnerships. These women seem less threatened by socio-economic stressors and more concerned with their intimate partnerships.

Three out of five women reported a good supportive partner and supportive families; they wanted their pregnancies, and although after HIV testing they were shocked and distressed, they still wanted their pregnancies. Two out of five women reported unsupportive partnerships, but supportive families. Their pregnancies were unwanted as a result of poor partner support, HIV testing. The result of the testing came as confirmation of suspicions, and the pregnancies remained unwanted. These two women were also depressed.

4.6.7.1 Wanted versus unwanted pregnancies

Women who were receiving support for the pregnancy from their partners (N=3) reported that the pregnancy prior to HIV testing was wanted; these women also reported family support.

Two women reported that their partner, contrary to what they had expected, was not supportive of the pregnancy. For both of these two women, despite family support, the fact that their partner was unsupportive of the pregnancy resulted in the pregnancy being seen as unwanted:

“We have had some problems because of this pregnancy, even though we spoke about it before, and I expected he wanted a child, my partner and I are never happy since the pregnancy [pause] we are fighting and I worry that things will never be the same between me and him, when I told my partner that I was pregnant the problems started” (P36)

“This pregnancy has been bad, I thought it was a good thing, but when I told my partner I was pregnant he did not give me a clear answer, then my mother wrote a letter to him telling him she wanted to see him and he kept lying saying he will come but he did not” (P43)

Rejection by a partner caused significant emotional distress and left women feeling isolated, alone and overwhelmed:

“When I call him he always says he is busy, sometimes he sends me a please call me and when I call him he says whatever he likes...what this man is doing to me right now... .. maybe when I take the phone and buzz him and he calls and tells me all that he wants, abusing me then I think about alot of things when that happens, I think about killing myself, or aborting the baby” (P43)

4.6.7.2 HIV testing

The discovery of their HIV status brought a significant shift in the levels of personal distress in the narrative for this group of five women. However, it did not introduce changes in their perception of their pregnancies as wanted or unwanted, or bring about changes in their level of support, mainly as a result of the choice made not to disclose their HIV positive status to their families or partner.

The two women who had experienced partnership conflict as a result of the pregnancy, and described their partner as unsupportive, described learning that they were HIV positive as confirmation of their suspicions. Both felt worried about their status at the time of testing given recent partnership difficulties:

“I did think it could happen, because like I already told you, my partner is not behaving well, so I was worried what he could come with something” (P43)

The remaining three women who had reported good partner support and wanting the pregnancy, described learning their HIV status as a shocking, hurtful and distressing event, and to some degree still found it unbelievable even at the time of the interview a few weeks later:

“I don’t want to talk about my results, because I still don’t believe them, it was such a shock, I just can’t believe it’s real that its really happening to me” (P28)

“I am angry and that has not passed, it is sitting heavy on my heart” (P20)

For all five women, learning that they were HIV positive had significantly changed how they saw their lives and their pregnancies, and none had felt comfortable to disclose their status to either their partner or their family:

“The cause of all these worries I have is that I am HIV positive, my life really changed that day, I haven’t told anybody, I am scared, where to start” (P36)

Non-disclosure among these women was also a strategy for ensuring the continuation of existing support from family, or for avoiding rejection or abandonment by their partners:

“I was really worried at first but now I have accepted, but I haven’t told anybody, because they will run away, and I need them, so it doesn’t help to tell them, it won’t help them to know and it won’t help me for them to know” (P43)

My feelings have changed alot since I tested, mainly because my partner doesn’t know anything about the HIV and I don’t know how he will react to it [HIV] so I just haven’t told anyone, because I think it’s important to tell my partner first, but I am afraid to tell him as it will change everything” (P40)

All five women described disengaging from HIV as much as possible in order to cope with the news:

“I have just put it out of my mind, it still worries me, especially when I am alone, but I just try to put it out of my mind” (P40)

This approach to disengaging with HIV was successful in that it allowed the three women who had previously wanted their pregnancy to retain their sense of ‘wanting’ the pregnancy:

“The pregnancy, I am still okay with it, there have been some changes that is worrying me, since I tested for HIV and found out I was HIV positive I have a lot of worries, but I am still happy with it, I still want the baby” (P20)

For the two women with unwanted pregnancies prior to HIV testing, these sentiments were retained and somewhat worsened as a result of testing HIV positive:

“All of these really bad feelings started when I got my results, when I learnt that I was positive” (P36)

4.6.7.3 Prevention and health risk behaviours

All five women were worried about the well-being of their babies, having learnt their HIV positive status; they worried that their babies would be infected. Women felt isolated in these worries as they did not have anybody close to them to talk to. Among these five women, one of the three women with wanted pregnancies was diagnosed as depressed, as were both the women with unwanted pregnancies. Women with wanted pregnancies who were not depressed

were more able to be hopeful in their expressed coda about the pregnancy and to keep HIV in perspective:

“I am hopeful about my baby, that my baby will be ‘isingqazu’ you know a good baby, normal like other kids, a fresh and beautiful baby” (P20)

“Yes, I do worry, it cannot be life if you don’t experience worries....I do worry about my health, I ask myself how long will I live, what will happen after the delivery, will I get sick or maybe I will die, but I have to cope, so I have to just do anything to cope...these thoughts don’t last, they go away, it’s just sometimes I feel that way, not always” (P40)

Despite having a wanted pregnancy, being HIV positive and depressed made it difficult to be positive about the pregnancy:

“At the beginning of the pregnancy things were fine, I was happy, but now I am worried, I have learnt my HIV status and I am worried, I am worried about being sick and about the baby being sick, it occupies my mind all the time, I can’t be happy about this situation” (P28)

Women with unwanted pregnancies were also depressed and felt hopeless and helpless to influence the outcome of their child’s status.

“I don’t know if the baby will be infected or not, but I will take the pill, and what will be will be, nothing I can do” (P36)

“I am not thinking about the baby because I didn’t want it, I even thought of leaving it at the hospital but my family said that I shouldn’t, what worries me most is this man, he is not supporting me and I am only his girlfriend, he already has a wife, maybe that is why he is throwing me aside now, I just feel like I don’t care what happens next” (P43)

4.6.8 Group 4: Unplanned pregnancies among women who tested HIV positive

This group of 23 women’s narratives were fairly diverse, with several subgroups of narratives being identified, mostly around partner and family support, but also around the HIV test result.

The larger group of 23 unplanned HIV positive women was split fairly evenly in terms of whether the pregnancy was wanted or unwanted prior to HIV testing, with 11/23 women reporting a wanted pregnancy as a result of receiving either partner or family support or both, and 12/23 women reporting that the pregnancy was unwanted as a result of an unsupportive partner and low levels of support from family.

Seven of the twenty three women reported having supportive partners, and of those, 6/7 had families who were not supportive. Sixteen of the twenty three women had unsupportive partnerships, and of those, 11/16 also had unsupportive families. These eleven women were particularly vulnerable, with almost no support structure prior to testing for HIV.

For all 23 of the women in this group, HIV testing had been a distressing and traumatic event given that they had tested positive, and very few felt prepared. Fourteen out of twenty three reported shock, distress and disengagement as way to cope with learning their HIV status, while a smaller group of 6/23 had concerns about their status, given their partners infidelity, and hence their HIV status was a confirmation although still highly distressing. Half the women responded to HIV testing by confronting their partners, resulting in significant partnership conflict, while a third of the remaining women chose not to disclose, and the remaining third disclosed to family and received some support. Feelings about wanting the unplanned pregnancy shifted substantially after HIV testing, when ten of the eleven women who had resolved before HIV testing that the pregnancy was unplanned but wanted, reported that the pregnancy was now unwanted given their HIV status. This was the only group in the sample of 56 with such a noticeable shift from a wanted to an unwanted pregnancy after HIV testing. Across all 56 pregnancy narratives, this sub-group of women, after HIV testing, included the highest number of unwanted pregnancies (16/32), and had the highest number of women who were depressed (14/27).

4.6.8.1 Wanted versus unwanted pregnancies

Among the 11 women with an unplanned but wanted pregnancy, one woman had both partner support and family support. Half of the remaining women (5/11) reported no partner support but good family support (such as a regular source of money towards care of the child, or family members offering to help with practical things such as child care) which mediated the

effect of the unplanned pregnancy and an unsupportive partner. Family support could mediate the absence of partner support:

“It was hard at first, but I am feeling okay and I am doing fine, I have some worries but I am fine, my family is supporting me” (P15)

“I have my mother to support me, I tell myself that she will not abandon me now that things are like this, I think about what my life will be like when I am older, I wanted to finish school first before I had a baby, but this happened, but my mother will support me, she will look after the baby so that I can go back and finish school next year” (P27)

“I can always find a person to support me, I have lots of people in my family, some are far away but I can move if I need them later” (P20)

The remaining (5/11) women with wanted pregnancies reported a supportive partner but little or no support from their family; however partner support alone was sufficient to ensure that the pregnancy was wanted.

Among these women the acknowledgement of the pregnancy from the partner also resulted in some confidence that the partner’s family would assist with the cost and care of the child. As such, whether the father acknowledged responsibility for the child was an important key factor in a wanted pregnancy.

However, support from the partner’s family often came at the price of personal dignity or autonomy, and many women had to subjugate themselves to ensure ongoing support. In addition, partners and their families would only be held responsible for their own children/grandchildren, and not for any other children the women may have had from a previous partner:

“Even now he is running away from me and not supporting me, but to other people he takes responsibility, he claims and accepts it is his child, so that helps” (P21)

“If my partner doesn’t take care of this baby then I can go to his family and they must help me, but for the other kids, they don’t have a father so I have to work to support them, because this man cannot support another man’s child... I am just worried about how I can help my kids, those who do not have a father” (P10)

“My husband’s family is not good, they don’t like me and they treat me badly, they are very harsh to me, there is one sister-in-law who is good to me, but that is all, but I have to just take it, what else can I do” (P9)

“It is hard with my partners family, my in-laws, I feel like I am not welcome, they are angry about the baby and I don’t think that they like me for him, but I just have to swallow it no matter how badly they treat me” (P52)

Women who reported an unplanned and unwanted pregnancy prior to HIV testing (12/23) also reported distress and worry about the pregnancy. These women were regretful and felt shamed over not preventing the pregnancy; several expressed regret that the pregnancy had come to soon after a previous child, and most women reported being naive or careless about contraception, or related having low autonomy over their reproductive health choices:

“I feel very stupid about this pregnancy, I didn’t use protection and I was not on contraception, I didn’t plan the pregnancy but I have never been on contraception in my life, I have three children already and every time I don’t know what happens, many times you just don’t get pregnant so you just don’t think about it, you don’t think it will happen until it does” (P50)

“This pregnancy has not been good because my last born is still young, it’s too soon, I am not ready for it” (P9)

“My husband was the one who didn’t want me to use contraception, but now he is not supporting me...it’s hard because I don’t even have money to come to the clinic, I have to try something always to get him to give me money to come it’s a big story, I am in his hands” (P9)

Among women who had an unplanned and unwanted pregnancy only one woman reported partner support for the pregnancy, but this woman had little or no family support and was particularly stressed by her partner’s unemployment:

“My partner is okay about the pregnancy but he is not working and there is no money, so I don’t know how I am going to feed these children, I don’t really worry about my health, I worry about feeding the children, it’s the children that I worry about”(P53)

The remaining women with unplanned and unwanted pregnancies (11/12) reported little or no partner support, and in most instances, the pregnancy had resulted in significant partner conflict, which led to the pregnancy being unwanted:

“We have had some problems because of this pregnancy, my partner and I are never happy since the pregnancy...we are fighting and I worry that things will never be the same between me and the father of the baby, when I told my partner that I was pregnant the problems started” (P52)

“How has this pregnancy been like for me, well I am not happy with this pregnancy at all if that’s what you mean, because it was something I was not expecting and I have had so many difficulties with my partner over it sometimes I think about alot of things, like when my partner and I argue, and you feel abused and you are pregnant” (P10)

Very common themes among this group of women were concerns about their romantic relationship. Most women related that beyond partnership conflict there were difficulties with their trust in their partners. Nine out of eleven women cited examples of fears of abandonment or of infidelity as their main concern in their relationships, which caused significant distress even prior to HIV testing:

“He is not around much, since the pregnancy, and I don’t trust him, I get worried when I don’t see him, we don’t have much time together any more” (P36)

“The problem is that my husband cheats on me, and we argue, if he didn’t do these things maybe I would be fine, but I am not fine” (P37)

“We used to live together, and then the problems started when he had an affair and he started not coming back home...I am worried that he will go and live with his girlfriends and I will end up alone” (P10)

“The problems come with my partner being full of trouble, when I went away last time with my other child, when I came back he was with another girl, and it really hurt me” (P21)

This group of women also reported little or no family support for the pregnancy, indicating particularly high social support risk among these women. Concern over socio-economic stressors was very salient amongst this group of women:

“There is no one I know here, because my relatives is not close by, I came here for him, when we got married, so my family is not here and they are not happy that I married him in the first place, they will say it’s his problem this baby” (P7)

“It worries me a lot that I am unemployed because I am not able to provide for my children, sometimes I see something that I want but cannot buy it because I do not have money and I don’t have anyone to support me, the father is also unemployed, I stay with the family so I do eat but it’s not easy, you are supposed to look after your children to provide for them, but I am failing to do that and I worry that the family will chase me away and say I must take my children and go and stay with the father” (P14)

Women with unplanned and unwanted pregnancies found it very difficult to feel positive or to anticipate with any joy the birth of their baby:

“I have never been happy about this pregnancy, so I can’t even think about what this baby will be like or how I will be towards him” (P53)

4.6.8.2 HIV testing

For women who had not wanted the pregnancy, HIV only served to worsen their predicament, and often brought to the forefront issues which had preceded the HIV event, such as a lack of trust or fidelity in their partnership. Women with these cumulative risks were also more likely to be depressed:

“I am in a bad situation with this pregnancy, firstly is that I have a child that is not grown enough yet; second I am already pregnant with another child, and thirdly now I have learnt my status, so things are adding up to be terrible” (P35)

“Things were not good with my husband, there was no trust and there was no support, once his sister accused me of taking money and he wanted to hit me because he believed her, later they found the money under her pillow, she wanted to make me and my husband fight and she managed it because he doesn’t support me, so when I told my husband I tested, he was shocked and asked me why I did that, he said I don’t trust him, and he is right, I don’t, but this problem came long before HIV” (P9)

For most women in this sample, regardless of whether the baby was wanted or unwanted, HIV testing had devastating results, and made women feel they no longer wanted the pregnancy:

“This pregnancy has not been good because now I know I have the virus and I think I might die and leave the baby, so my feelings are all wrong and there is no one to help, I wish I was not pregnant because I am making this baby suffer no matter how it works out” (P16)

Twelve out of twenty three women in this sample responded to learning their HIV status with disengagement and chose not to disclose out of fear of stigma or rejection:

“My results, I didn’t care, do you want to know my results, my results were positive, I didn’t care, and nothing has changed” (P44)

These women felt angry and betrayed by their partners, and were particularly regretful that they had not acted on their previous concerns for fear of how it may have impacted on their partnerships. Many blamed themselves for becoming infected:

“I did think maybe it could happen, because my husband is not behaving well, so I was worried what he could come home with, but somehow I didn’t think he would and now this is it, he has done this to me now and there is nothing I can do, because I didn’t do anything before” (P37)

HIV positive depressed women were also concerned about the threat of violence and stigma which prevented disclosure.

“I have not told my partner, I can’t, he will kill me that one, and don’t like to tell others because they will go gossip so it’s better for me to shut up with my secret” (P44)

Four of the women who wanted their pregnancies, and who had family but not partner support chose to disclosure to family, in particular to their mother or grandmothers, who offered support and who were helping them to cope. This family support was a positive factor, which facilitated coping with an HIV positive result:

“It didn’t change how I feel about myself but I did feel worried that I will infect my baby at birth, but I spoke to my mother and she said I should not worry, because the virus is known now, because I did a good thing by testing, now we can fight it, she said I will be fine” (P25)

“Being HIV positive means I am in a problem, but I am hopeful, I am not very worried, when I got home I told my grandmother and she said I should be strong, she was shocked, but as an older person she was very supportive, and advised me to look after myself” (P52)

“I told my family, they just said we will be strong together and do everything right for the baby and that I will be fine, ‘Hhayi’ but I feel that I am not confident that life will go on, but at least they are there with me” (P42)

Among women with unplanned, unwanted pregnancies who tested positive, a few women appeared to be coping despite multiple stressors. This coping was in part related to positive family support. It was also common among women who were not depressed and who tended to report higher self-esteem and demonstrate specific coping skills. These factors mediated the extent of the effect of the unplanned pregnancy and other psychosocial stressors, such as learning that they were HIV positive:

“This pregnancy was not the best thing, because I had to stop school, so in that way it has not been good to me, there is the HIV, but it’s okay, it has not been too difficult. It is difficult sometimes at home because they shout at me because I am pregnant, but it’s not too much, I find a way to cope and to try to be cheerful” (P48)

“When I learnt my results I was not worried, I accepted it, I was a bit nervous and upset but you come to accept that you can’t change it, so you have to believe in yourself and find a way to cope” (P15)

4.6.8.3 Prevention and health risk behaviours

Two women in this group of HIV positive women related stories of feeling desperate and considering termination of pregnancy earlier in their pregnancies, but both these women reported significant stigma and cultural norms which discouraged consideration of abortion as a reproductive health choice following an unplanned or unwanted pregnancy, despite termination of pregnancy being a legal right:

“It wasn’t nice from the beginning, I didn’t plan for this, I was so frustrated when I found out I was pregnant I even thought of aborting the way things were, even though that is not accepted here and I know it is wrong, so I can’t do it, but I can’t handle the idea of being a mother, I am

not happy, I am scared, even now, if I had asked the nurses they will shout at me and tell everybody I want to kill the baby” (P36)

Receiving an HIV positive diagnosis had worsened their feelings about the pregnancy and created further regret over not being able to exercise a choice to abort, in particular since the HIV diagnosis had come late in the pregnancy:

“I just have to accept it because I can’t do an abortion, it’s too late for that and it would not be accepted” (P10)

The quality of PMTCT counselling and the availability of information also served to reduce women’s initial fears related to HIV after testing, but women had informational needs which often were not being met given the emphasis on PMTCT:

“The information they gave me about what to do was helpful, but I worry about what will happen after the baby has come, they gave me information about how this thing works in the pregnant body, and the things to take so that the baby does not get it, but what will happen after, I worry I will get sick, wont they give me something that will make me not get sick, I need to know more so that I don’t get sick” (P8)

By far the largest group of women (14/23) responded to HIV testing with disengagement in order to cope, however, this created barriers to receiving health information and support, and in engaging with prevention. Depressed women were more likely to see HIV as a death sentence and to display disengagement coping strategies:

“I am always stressed and thinking about it and I can’t even talk to people about it, I don’t think this baby will be alive, I always think about my baby as dead. I think that my baby won’t have a long time to live...and myself, I see myself as a dead person alive” (P35)

The most salient worry reported by all HIV positive women, including those who were depressed, were fears over their own mortality, the prevention of infection in their babies, and who would care for their children:

“Yes, I do worry, it cannot be life if you don’t experience worries....I do worry about my health, I ask myself how long will I live, what will happen after the delivery, will I get sick or maybe I will

die, what will happen to my babies when I am gone, but I have to cope, so I have to just do anything to cope...these thoughts don't last, they go away, it's just sometimes I feel that way, not always, but it is good to be able to get support from the clinic" (P15)

"I am worried because I don't know if the baby will be infected or not, of course I will take the pill, and it helps very much that you can take it to save your baby, and I suppose you have to think what will be will be, nothing I can do, but I am worried, I can live with this myself but to know that I gave it to my innocent child and that this little one will suffer with being so sick, that is very hard" (P25)

Knowing about HIV treatment, beyond PMTCT, increased optimism significantly:

"I was wondering whether I would be able to cope, bring up my children properly and if I will live, but I spoke to a person who is infected and who is getting treatment and they explained to me how everything could be fine, and I have spoken to the sister and she explained everything so now I feel like, people need to understand it's like if you have blood pressure problems or diabetes, you can also die, it's the same" (P21)

4.7 Summary of results

- The prevalence of depression was high with close to half the women being diagnosed with depression.
- Most cases of depression were severe - including depressed mood, loss of interest and suicide ideation, and of chronic duration (with episode duration of at least 2 months).
- Evidence from qualitative data on the SCID interview suggests that DSM-IV-TR criteria can effectively be used to diagnose depression in this cultural context.
- Risk of suicide was found to be high.
- Socio-economic and psycho-social stressors, including a lack of access to a regular income and never having practical support from a partner were significantly associated with depression, as was living away from, or without family support.
- The EPDS was an effective screen for depression, but did not perform sufficiently to warrant its use as a stand-alone measure.

- Prevalence of depression on the EPDS measure using the highest recommended cut off of ≥ 13 was similar to prevalence found using the gold standard SCID.
- Significant items on the EPDS were similar to factors with high eigenvalues in the PCA.
- A three item version of the EPDS was as effective as the 7-item depression subscale and the full 10-item scale.
- Partnership and family conflict; unwanted pregnancies and testing HIV positive account for significant emotional distress, and depression influences prevention and health risk behaviours.

Chapter 5

Discussion

5.1 Introduction

This chapter provides an in-depth discussion of the results of this study.

The chapter describes the prevalence, pattern and timing of antenatal depression during pregnancy, the symptomology of antenatal depression and the evidence for or against a culturally-bound concept of depression. Thereafter, a clinical profile of depression is presented along with factors associated with depression from both quantitative and qualitative data sources. Lastly, the chapter presents findings on use of the EPDS as a screening tool for depression.

The chapter ends with a brief discussion of the sample characteristics and the generalizability of the research, a summary of the main findings and the limitations of the research.

5.2 The prevalence of antenatal depression

This section reports on the vulnerability of women to antenatal depression and examines the pattern and timing of antenatal depression.

5.2.1 High prevalence of antenatal depression

The prevalence of antenatal depression in this sample was very high (47%), with close to half of the women being diagnosed with depression. This estimate is four times higher than the prevalence seen in developed settings. For example, Bennett and colleagues (2004) found antenatal prevalence rates of 7.4% in the first trimester, 12.8% in the second trimester, and 12.0% in the third trimester of pregnancy in a meta-analysis of high income countries. Likewise, antenatal depression in this research was twice as high as prevalence estimates in Africa where Sawyer et al. (2009) found a range of 4.3% to 17.4% during pregnancy with a mean prevalence of 11.3%.

No research on antenatal depression in South Africa is available. However, the baseline study of 242 women (Rochat et al., 2006) found high rates of depressed mood (41%) using the EPDS screening measure. This finding is comparable to the prevalence found in existing research on postnatal depression in South Africa (in a range of 27 to 48%). The estimate of depression in this sample is also not discordant with levels recorded in non-pregnant samples in South Africa and Southern Africa. For example, Carey, Stein, Zungu-Dirwayi and Seedat (2003) found a prevalence rate of 37% in a primary health care setting in South Africa; and prevalence rates of 31.6% have been also been found by Muhwezi, Agren, Neema, Maganda and Musisi (2008) in a Ugandan primary health care setting.

While the rate of depression seen in this research is much higher than that evidenced during pregnancy in many Central and West African countries (Sawyer et al., 2009), this is consistent with data showing that lifetime prevalence of depressive disorders among adults is considerably higher in South Africa, than is seen in Western and Central Africa (Tomlinson, et al., 2009).

5.2.2 The timing of antenatal depression during pregnancy

The baseline study (Rochat et al., 2006) measured depression late in the second trimester, while this study examined depression in the third trimester of pregnancy. The rates of 41% and 47% respectively would suggest that the rate of depression is relatively stable in the latter part of pregnancy, with a slight increase in prevalence during the third trimester.

The upward shift in depression during the second half of pregnancy, from 41 to 47% should be interpreted cautiously given that the second trimester rate was established using the EPDS screening tool alone. The results of this research found a rate of 44% on the EPDS and 47% on the SCID at the same time point, suggesting that the EPDS may slightly underestimate depression in this population.

Given that no measure of depression is available for the first trimester, either from this or other research in South Africa, it is difficult to demonstrate with certainty that depression is highest in either the second or third trimester. A review of the timing of depression based on women's recall of episode onset and duration being two weeks, two months or six months indicates that only a small number of women experienced onset during the first trimester, most reported episode onset during the second trimester and third trimester. The majority of depressed women had first onset of depression during the second and third trimesters (67% with episode duration of 2 to 6 weeks prior to third trimester assessment) while only a small number (6%) reported earlier onset of depression suggestive of first trimester onset. Similarly, among the women not currently diagnosed with depression, only 9% reported an earlier pregnancy episode that was currently resolved.

Research from high income countries has found a particular vulnerability to depression in the latter part of pregnancy. Bennett et al. (2004) found that the rate of depression in the first trimester was similar to rates seen in the general female population, while rates in the second and third trimester were double those observed in the general population. The second trimester vulnerability evident in this sample is similar to recent research in China which showed the greatest vulnerability in the second trimester, and a similar pattern of slightly lower but stable rates at 6 weeks post partum (Ying Lau, et al., 2010).

Research on the African continent has found similar second and third trimester vulnerability. Abiodun et al. (1993) found a similar increasing relationship beginning with 20.8% in the first trimester, 33.3% in the second and peaking at 45.6% in the third trimester. Esimai et al. (2008) found that depression was twice as high in the third trimester as compared to the first trimester.

This would suggest that while the prevalence of antenatal depression in this sample is much higher than evidenced in high income settings, the pattern and timing of onset in the second and third trimester is similar. It is plausible, as Bennett and colleagues (2004) suggest that the increased rates evident in the second and third trimester may reflect the increased demands of pregnancy or that later pregnancy may be a risk for depression because of introducing a particular set of bio-psycho-social stressors to an existing vulnerable state.

Triangulation of qualitative interview results lends some support for this hypothesis, suggesting that distinct stressors increase over the course of the pregnancy and add to vulnerability in later pregnancy. As already stated, most depressed women reported second trimester onset. Similarly, narrative data showed that disclosing the pregnancy to partner or family had introduced significant relationships and financial stressors, often resulting partner, family or social conflict. Data collection did not examine when women had learnt of their pregnancy status. However, it is plausible, based on narrative data that in many instances women may have delayed disclosing the unplanned pregnancy, until it became unavoidable to do so around the onset of the second trimester. Narratives illustrated that pregnancy disclosure increased financial and relational stressors, at the same time as the pregnancy itself increased vulnerabilities as a result of physical transitions and transformations associated with the second half of pregnancy. Further, in families where there may have been earlier disclosure of the pregnancy, the second and third trimester would mark the beginning of regular antenatal care visits, a significant financial stressor to households, thus making financial worries more salient for mothers, and increasing family conflict. Many women reported that partners had initially expressed support but had 'run away' or avoided financial responsibilities as the pregnancy progressed. Similarly, mothers reported significant distress around the lack of resources to provide for the infant and that these concerns had become more pressing as the pregnancy progressed.

There are two cautions with regard to interpretation of the findings of this pattern of depression. First, care should be exercised in the interpretation of the episode duration data. Halbreich and Karkun (2006) warn that retrospective questioning, while often used in research, has the major limitation of possibly producing inaccurate prevalence data due to memory recall biases. It has been shown that in studies of depression which examine recall over longer periods of time, that recall of an adverse experience such as depression can be over-reported (Gotlib, Whiffen, Mount, Milne, & Cordy, 1989). The timing of depression during pregnancy described above is based on self-report and recall, and should thus be interpreted cautiously.

Secondly, the number of studies used to estimate the rate of depression in the first trimester of pregnancy in both developed and developing countries is very small. On balance, it is more accurate to suggest that less is known about the first trimester, than it is definitive that depression is lower in the first trimester. The low rates seen in this or other studies may simply reflect that depressed women delay seeking care, in which case the rate is likely underestimated (Bennett et al., 2004). A recent study examining trimester-specific risks found a higher prevalence of depression in the first trimester as compared to the second and third trimester (Bunevicius et al., 2009), suggesting that research to date is far from equivocal. High first trimester risks may be evident in South Africa, but were not examined.

Lastly, the conclusions which can be drawn from the qualitative interview data is limited in that women were not directly asked at what time point stressors and vulnerabilities were introduced. While women may have reported stressors increasing upon disclosure of pregnancy, without time specific probes such as ‘was this in the first, second or third trimester’ it is possible that the stressors reported on in the interviews were equally salient across the pregnancy. Trimester-specific risks among South African women and the stability of depression during pregnancy, and from pregnancy to the postnatal require further research. Research using longitudinal as opposed to cross sectional designs will assist in further elucidating this issue.

5.2.3 The continuum of risk from antenatal to postnatal depression

The results of this study, when examined together with existing South African data on postnatal depression, lends support to growing evidence that postnatal depression may develop along a continuum with emergent risk factors in pregnancy (Lau et al., 2010).

South African research on postnatal depression has found equally high rates of depression among a group of women with preterm infants (48%) compared to women who delivered babies full term (32%), when assessed one week postnatally (Madu & Roos, 2006). Among women recruited later in the postnatal period a slightly higher prevalence estimate of 36.9% was seen at 6 weeks postnatal (Lawrie et al., 1998). At a similar time point in a community-based sample, a prevalence of 34.7% was found when women were assessed at two months postnatal (Cooper et al., 1999). Spangenberg and Pieters (1991), who assessed women six months postnatal, found an even lower rate of 27.2%. This downward pattern of prevalence from current work is illustrated in Figure 5-1 and places South African published work on a continuum from pregnancy to the postnatal period.

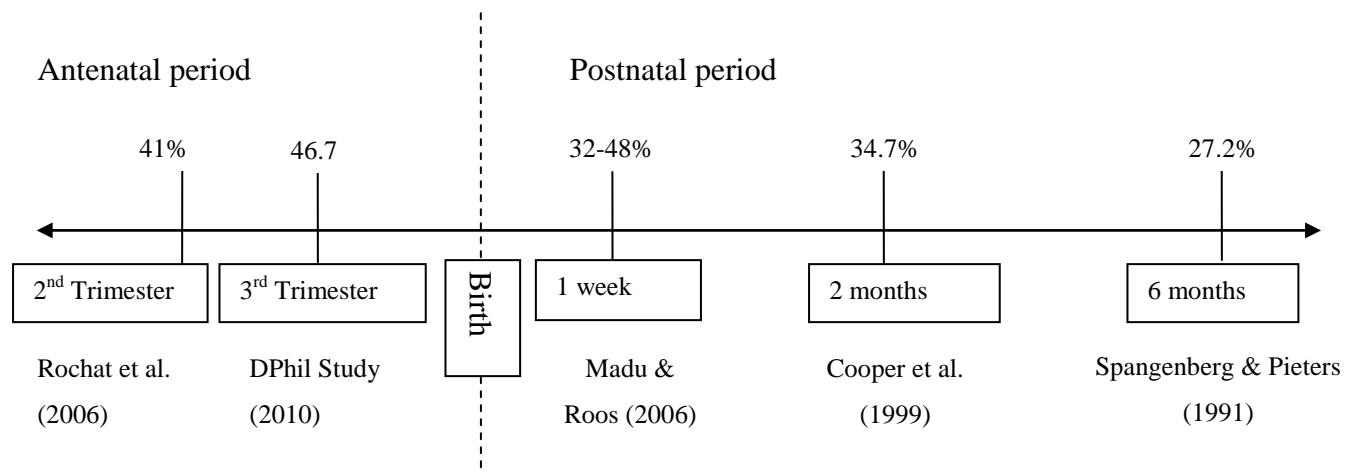


Figure 5-1 Continuum of risk for depression from the antenatal into the postnatal period

The downward shift in rates from the antenatal to postnatal period (illustrated in figure 5-1) is similar to research in high income countries which indicates that postnatal depression is often preceded by high levels of depressive symptomology during pregnancy (Evans et al.,

2001), and that a significant amount of depressive symptomology may decrease in the postnatal period (Heron et al., 2004).

This postnatal pattern has also been evidenced in large cohorts in middle income countries such as Australia (Milgrom et al., 2008) and in low income countries such as Pakistan (Rahman & Creed, 2007). Similarly, a recent meta-analysis by Robertson et al. (2004) found antenatal depression to be the strongest predictor of postnatal depression. The hypothesis that antenatal and postnatal depression in South Africa may follow the same continuum is preliminary, given that it is based on pattern of evidence from a group of heterogeneous studies, rather than within one longitudinal study.

While the estimates for depression during pregnancy in this study are higher than those evidenced in postnatal research in South Africa, this should also be interpreted cautiously. This research does not provide evidence to suggest that pregnancy necessarily has a higher risk for onset of depression in South Africa than the early postnatal period or any other period across the lifespan. This assumption cannot be made since the research did not examine depression in the early postnatal period or among non-pregnant women.

Robust evidence supports the fact that globally the early postnatal period has the highest risk of onset of depression compared to both pregnant and non-pregnant women (Vesga-Lopez et al., 2008), so it is plausible that depression in the early post partum in this group may have been higher still, had it been examined.

The only conclusion which can be drawn from this research is that antenatal depression is concerningly high, and that as a result it would be expected that postnatal risk is likely also high.

5.3 The symptom profile of antenatal depression

An aim of this research was to ensure rigour in translation, piloting and testing of depression measures in order to ensure a culturally valid and sensitive approach to the measurement of depression and to determine whether particular cultural variables complicated the diagnosis of depression using DSM-IV-TR criteria. Qualitative data collection on the SCID interview provided detailed data on what women expressed and reported about each of the depression signs and symptoms.

5.3.1 Cultural conceptions of depression

Very little evidence was found to support a culturally distinct diagnostic presentation of depression in this community. Data showed that women were most likely to use psychological language in their description of disturbance of mood and other symptoms. Most depressed women were able to make the subtle distinction between their pregnancy-related symptoms and their depressive symptoms. This would suggest that DSM-IV-R criteria are culturally valid and effective for assessing the presence or absence of clinical depression during pregnancy in this community.

These findings support the argument made by Patel (2001), who illustrated with case evidence from two diverse cultures (Zimbabwe and India) that as much of an argument can be made for similarities (an etic approach) as for differences (an emic approach) in the international literature on the epidemiology of depression. While the clinical presentation of depression among pregnant women in Zulu culture may be associated with multiple somatic symptoms of chronic duration, psychological symptoms are also as important to the diagnosis and can be easily elicited with probing. This finding is important since the development of culture-specific assessment methods are time consuming and expensive (Halbreich & Karkun, 2006) and most likely, not necessary in this context.

As Sawyer and colleagues (2009) have shown, there is limited evidence that a particularly culture-bound experience of depression exists in Africa or is diagnostically useful. Some countries in West and Central Africa, such as Ethiopia, have found high levels of somatisation, suggesting that in those contexts a culturally-bound depression may be a useful

consideration (Hanlon et al., 2008), but this is not generalisable to all African countries. Similarly, Posmontier and Horowitz (2004) showed that culture-specific presentations of depression were highly variable and uncommon. Instead, the expanding literature on maternal depression reflects that while there are cultural nuances which may heighten or protect against cultural susceptibility to depression at the time of childbearing, the evidence on balance does not support the use of separate clinical criteria in the determination of depression.

Little evidence has been found in South African research or in recent work with postnatal women in Zimbabwe (Chibanda et al., 2010a) to support a distinct Southern Africa cultural-bound presentation of depression symptoms, although it is noteworthy that this subject area has received little research attention to date. Further afield in Africa, in a recent qualitative study of women's distress during pregnancy in Tanzania, Kaaya et al. (2010) also found typical features of depression, and concluded that while local idioms are important and feature strongly in women's descriptions of depression and distress during pregnancy, the construct of depression in these contexts is similar to biomedical criteria for depression in other contexts. Patel (2001) cautions that continued hypervigilance over cross-cultural difference and the denial of cross-cultural similarities (in particular in relation to the diagnosis of clinical depression) may serve to undermine the allocation of resources for disorders such as depression in low and middle income settings.

Careful distinction needs to be drawn regarding the role of culture in the diagnosis of depression, as opposed to intervention for depression. While there is little justification from this research to warrant the development of culturally-specific diagnostic methods, this does not imply that those cultural frameworks are not important considerations in the development of treatment approaches for depression. Women's experiences of depression, what is construed as the cause of depression, what they would consider helpful in response to depression, is likely heavily mediated by culture. The scope of this research is limited in its focus on diagnostic rigour and cultural sensitivity in the measurement of depression, and did not undertake an in depth exploration of women's cultural understandings of being depressed within this specific culture. While qualitative interviews explored psycho-social risk factors common among both depressed and non-depressed women, the specific role of culture was not directly addressed or explored, and the meaning women assigned to being either depressed or not was not examined.

Swartz (1998) provided important evidence for higher levels of somatisation and specific cultural metaphors in narratives regarding the causes of depression. There is evidence in this research that a subgroup of women did express their feelings using somatic and metaphorical expressions, in an effort to create a coherent narrative of their experience of depression. However, on the balance, most women's symptomology could be identified using psychological language and DSM-IV-TR constructs. Given that most women in this sample were suffering from chronic as opposed to acute depression, this earlier South African work by Swartz (1998) which sampled mostly psychiatric settings, may also better describe an acute symptomology which is more frequently expressed as somatic illness as compared to more psychological descriptions seen at later more chronic stages of illness in the international epidemiology of depression (Patel, 2001).

Narratives, somatic symptoms and metaphorical expressions are frequently cited in many cultures across the globe as means to bring meaning to experience, in particular in relation to experience of mental illnesses such as depression or in response to trauma or extreme stress (Waitzkin & Magana, 1997). Somatic and metaphorical expressions are thus an important factor for consideration in the treatment and management of depression, but their relative importance in relation to diagnostic criteria should not be overestimated in resource poor settings.

5.3.2 The clinical presentation of depression

Exploratory principle component analysis showed that a single component accounted for most of the variance, and is thus useful in guiding the detection and referral of women at high risk for depression. The data show that depression is likely to feature the presence of the following important symptoms: disturbance of mood, loss of interest and suicide ideation (strong indicators with higher eigenvalues); and the presence of concentration difficulties, sleep disturbance (specifically delayed sleep and middle insomnia) and to a lesser extent, worthlessness (moderate indicators with lower eigenvalues).

This clinical profile was also well supported by the qualitative data which suggests that women frequently reported depression in relation to its effect on their emotions, their interactions with others and their day-to-day homemaking functioning. The profile of depression found in the principle component analysis was also supported by other data sources, including the results of

the EPDS where the three items measuring these similar constructs also emerged as most significant.

While weight loss or gain and changes in appetite and energy were frequently reported, it is not likely that these significantly impacted on the level of depression evident in this sample, which remained high even when these symptoms were removed from analysis. This would imply that the reporting of symptoms which are commonly confused with normal side effects of pregnancy did not overestimate the level of depression in this sample, as is often raised as a concern in the literature (Kammerer et al., 2009; Lusskin, et al., 2007).

A Swedish study examined the sensitivity and specificity of SCID symptoms in the antenatal and postnatal period and found that loss of appetite was not associated with depression either antenatally or postnatally (Kammerer et al., 2009), a finding which is similar to the results seen in this study. Kammerer and colleagues (2009) also found that the most sensitive symptom during pregnancy was concentration, while agitation or retardation were found to be good indicators of depression. In this study, while concentration difficulties were common, agitation and retardation was not. Kammerer et al. (2009) also found that symptoms in the antenatal and postnatal period appeared to be quite distinct and different from one another. This may suggest that antenatal symptoms may not be the same as postnatal symptoms, and hence this research may not be readily generalisable to postnatal settings in South Africa.

5.3.3 The presentation of severe depression

Most cases of depression were severe with between five to seven symptoms being reported, and with symptoms being chronic and lasting for more than a two month period. Severe depression brings with it significant disability and lowered functionality. McKee, Cunningham, Jankowski and Zayas (2001) found that among low income African American women with high rates of antenatal depression (51%), depression was strongly associated with a global reduction in functional status and perceived well-being. Interestingly, these authors found that increasing the number of social supports did not necessarily reduce the impact of depression among severely depressed women, suggesting that for women with severe depression, psychological rather than social interventions may be more appropriate. The impact of depression on perceived

well-being during pregnancy is important because this has been shown to positively predict the mother's early postnatal role adjustment (Gotlib & Whiffen, 1989; Paarlberg et al., 1996).

Concern is raised over the possible impact severe depression may have on health-related functional status, in particular in the context of HIV. Many studies have suggested that depression is of concern because untreated depression is associated with lowered uptake of highly active antiretroviral treatment (HAART) (Cook et al., 2006); lowered adherence to anti-retroviral medication (DiMatteo, Lepper, & Croghan, 2000; Starace et al., 2002); and increased disease progression (Ickovics et al., 2001). Research with HIV positive women by Cook et al. (2004) suggests that AIDS-related deaths are more common among depressed women, but also that depression symptoms were more severe among women in the terminal phases of AIDS disease, raising questions about the direction of causality in late stages of HIV illness. Some evidence, in research including both genders, suggests that mood disorders may have greater influence earlier in HIV illness progression by influencing uptake or access to HAART medication, and that this is much more frequently so in women and among minorities (Turner & Fleishman, 2006). Recent literature (Leserman, 2008; Leserman, Barroso, Pence, Salahuddin, & Harmon, 2008) suggests that depression, stress and trauma do account for variations in HIV disease progression.

Research has shown that among HIV positive pregnant women, depressive symptomatology was considerable, despite excluding somatic items in order to avoid confounding from pregnancy or HIV-related physical symptoms (Blaney et al., 2004). These authors found that the psychosocial factors significantly predicted the level of prenatal depressive symptoms beyond the effects of demographic and health-related factors. Perceived stress, social isolation, and disengagement coping were associated with greater depression, and positive partner support with lower depression. Disengagement coping was found to be common among depressed women in qualitative data, in particular in relation to HIV testing in this study. Functional health status may influence engagement with health care, as is common in the literature on depression in the elderly (Blazer, 2009), adolescents (Caldwell, Rudolph, Troop-Gordon, & Kim, 2004), and to a lesser extent, in evidence amongst postnatally depressed women (Murray, Woolgar, Murray, & Cooper, 2003). This is a concerning finding among this particularly vulnerable group of women for whom access to health care is a key determinate of both maternal and child outcome.

There is consensus that depression plays an important role in morbidity and mortality in relation to HIV illness, and thus, warrants attention in light of the functional disability. In examining the effects of interventions for depression in the context of HIV illness among women, Cook et al. (2006) demonstrated that, among depressed women eligible for HAART, the use of antidepressants plus mental health therapy, or use of mental health therapy alone, significantly increased the probability of HAART utilization, compared to receiving no depression treatment. Use of antidepressants alone did not differ significantly from receiving no depression treatment, and may be limited during pregnancy. Mental health interventions are feasible and warranted.

Given the lack of significant association between depression and HIV in this research, functional disability is also a concern among women who were HIV negative in this study. Qualitative evidence in this study supports the literature on depression and functional disability, in particular in relation to social and health care disengagement coping strategies commonly seen among depressed patients. While this study did not measure functional disability directly, it does offer preliminary evidence of disengagement behaviours, warranting further research to better understand functional disability among antenatally depressed women. Olley et al. (2004) in research in South Africa, found that disengagement was common to depressed men and women following HIV diagnosis, and Lee and Chung (2007), in research on postnatal depression in Hong Kong, found disengagement a common feature of postnatally depressed women. The risk health-related functional disability in areas of high maternal and child mortality (such as Southern Africa) highlights the urgency with which treatment intervention for depression needs to be made available both in antenatal and primary health care.

5.3.4 High rates of suicide ideation

In this research, the rate of suicide ideation was high (22.9%), and is more than twice the national lifetime prevalence of 9.1% in South Africa (Joe, Stein, Seedat, Herman, & Williams, 2008a, 2008b). While the national pattern suggests that there should be a significant drop from thoughts of suicide to plans (3.8%), this was not evident in this sample, where plans followed ideation closely, although attempts of suicide at 1.8% was in line with the national figure of 2.9%. Suicide ideation is concerning given evidence that suicide is one of the most common causes of death in the first year postnatal (UNICEF, 2008).

South African research has shown that hanging (36.2%), shooting (35%), and poisoning, (9.8%) are the most common methods used in fatal suicide, while overdosing on medication is more common to attempted non-fatal suicides, which are frequently a cry for help and signal less intent (Schelbusch, 2005). In this research, hanging and poisoning oneself were common to self-harm plans. Schelbusch (2005) has showed that methods of suicide become more severe and lethal as intent increases, and are usually indicated by methods such as hanging, shooting or poisoning. The high level of reporting of what is described in the literature as ‘increasingly lethal methods’ such as hanging and poisoning in this study may suggest women had higher intent; or it may simply reflect that women in rural areas, with lowered access to health care and medication are left with fewer less lethal options to consider when contemplating suicide.

This research refutes anthropological literature which suggests that in African cultures suicide or suicidal ideation is taboo and thus not a risk. On the contrary, perceptions that suicide is taboo may simply lead to less attention being given to risk of suicide in primary health care settings. Similar denialism has led to inadequate attention being paid to suicide among African Americans in the United States, and while cultural beliefs and religiosity have been shown to be associated with low prevalence of suicide, factors such as education are shown to be more strongly associated with suicide rates than culture alone (Stack, 1998).

Research in South Africa suggests that suicide is on the increase among young adults and women in particular (Schelbusch, 2005), and that suicide is a poorly attended to public health concern in the context of HIV. Likewise, literature supports the hypothesis that receiving an HIV diagnosis may increase suicide ideation. Cooperman and Simoni (2005) found that 27% of women reported attempting suicide after learning their HIV diagnosis, a third attempted suicide within one week of learning their HIV positive status, and half attempted suicide within a month of HIV diagnosis. These authors also found that having children had a positive association with suicide ideation; this is similar to the findings of this research which found that many women still considered suicide, despite being pregnant and having other dependent children.

5.3.5 The reporting of minor depression

An important finding in this research is that the mean level of depressive symptomatology reported by women was high (mean number of symptoms was 5.11) with at least half the women

in the sample reporting both disturbance of mood and loss of interest, and a further quarter also reporting at least four other symptoms. These findings show that depressive symptomology was common among all women regardless of whether or not they were diagnosed with a major depression. EPDS scores show that the largest proportion of women had some depressive symptomology with scores between 9 and 13. Low income country research has shown that this pattern of generalised distress among pregnant and postnatal women is not uncommon and may have consequences for children's health by reducing or interfering with the quality and consistency of care a child receives (Rahman, Patel, Maselko, & Kirkwood, 2008).

The reporting of high levels of depressive symptomology, in the absence of a major depression, is not uncommon in the literature on antenatal depression. Heron et al. (2004) found higher levels of reporting of depressive symptomology in the third trimester of pregnancy than in the postnatal period, and Gavin et al. (2005) showed that when cases of minor depression (the reporting of depressive symptoms but without the severity or duration required for a diagnosis of major depression) are included, prevalence estimates of antenatal depression in the second and third trimester frequently double.

Bennett et al. (2004) raise the concern that while people with major depression may experience substantial functional and social impairment; people with sub-threshold depressive symptoms (which are of less severity and of shorter duration) may also experience significant dysfunction which warrants attention. For example, (Gotlib, Lewinsohn, & Seeley, 1995) showed that many measures of psychosocial dysfunction did not significantly differ between false positives and true positives on depression screening measures, suggesting that women with a high number of acute symptoms on a screening tool may be presenting with as much functional risk as women diagnosed with major depression. Increasing evidence suggests that clinical depression may not be significantly distinct from depressive symptomology in terms of its impact on functioning (Solomon, Haaga, & Arnow, 2001).

The high level of reporting of depressive symptoms by women in this sample does to some extent dispel concerns that depression during pregnancy may be highly stigmatised, as is frequently found in Western societies (Luskin et al., 2007). In developed contexts such as the United States, it is estimated that stigmatisation of depressed mood during the antenatal and

postnatal period is a common reason that the majority of cases go undetected and untreated in primary health care contexts.

However, if depressive symptoms are easily volunteered and salient to all women, the question arises as to what distinctions can be made regarding the level of severity of symptomology, in order to guide the efficient identification of the highest risk groups in resource-limited settings. While it is likely that all women may benefit from treatment, not all women presenting with depressive symptomology may warrant treatment. It is possible that with such a high level of depressive symptomology being reported, the severely depressed woman may become lost in the clutter of more generalised depressive symptomology. As such, clinical profiles of major depression warrant further interrogation. The findings from this study show that suicide ideation may be a significant marker for women needing urgent attention, since only three non-depressed women reported suicide ideation.

5.4 Factors associated with depression

Increasing attention in the literature has begun to focus on the risks that extreme poverty, socio-economic stressors and the threat of HIV introduce for women living in low to middle income countries (Wachs et al., 2009). The impact of mental health in developing countries is integrally related to human potential and human rights, and it is not likely that health advances will hold much value without improvements in mental health and quality of life. A recent Lancet series on the status of mental health in developing countries demonstrated the significant burden of mental disorders and the links between these and other health conditions, arguing that there can be no meaningful health without mental health (Prince et al., 2007).

While the current evidence on mental health in sub-Saharan Africa is limited, available research supports the argument that gender inequality, poverty and HIV are the main drivers of depression and other psychological disorders among women (Brandt, 2009). Broadhead and Abas (1998) suggest that in all likelihood a convergence of risk factors around poverty and socio-economic stressors have contributed to the high prevalence of depression. A similar argument can be made for depression during pregnancy in this sample.

5.4.1 Regular income and socio-economic stressors

The factors associated with depression in the quantitative analysis show that socio-economic and social support variables are strongly related to depression in this context, as they have been found to be the high income countries (Bennett et al., 2004). Access to regular income was associated with depression, with women who had access to regular financial support being 70% less likely to be depressed and women who always received practical support from their partner being 80% less likely to be depressed. It is noteworthy that partner practical support also had an interactional effect with the regular income variable. Living away from a family network or support structure significantly increased the odds of being depressed, with women living in non-family environments being close to seven times more likely to be depressed. From a vulnerability-stress perspective this would suggest that greater economic security and practical social support from a family network provided some resilience against onset of depression.

An association between socio-economic status and maternal depression is common in the literature from low, middle and high income countries (Gazmararian, James, & Lepkowski, 1995; Lund, et al., 2010). It is likely that the level of poverty and socio-economic stress within the community where this research took place contributed significantly to the high rates of antenatal depression. Sources of income were most frequently reported to be a woman's own employment or income or a regular remittance from her partner. As Das et al. (2009) have shown, it is more likely that economic stressors and shocks than general consumption poverty introduce mental health threats. It is probable that the pregnancy itself, or a loss of regular income support as a result of the pregnancy, would constitute a significant economic stressor given the levels of poverty in the community, and would likely explain high levels of mental health risk within a socio-economic framework.

Further, Patel and colleagues (2007) argue that while poverty is closely related to depression, the consequence of poverty is also confounded by the loss of work capacity brought about by the depression, and by the treatment costs of depression, which add to economic stress in a circular way, and can trigger other stressors such as increased domestic violence, in turn worsening the depression. The review by Lund et al., (2010) highlights the debate in the literature around the reciprocal relationship between depression and poverty. These authors summate that the theory regarding the mechanisms of the reciprocal relationship are broadly divided into the "social causation" theories, in which the conditions of poverty, such as stress, increased negative life events, worse physical health, reduced access to health care and stigma are thought to precipitate or maintain mental ill-health, and the "social selection" or "social drift" hypothesis, in which people living with mental illness are thought to drift into, or remain in, conditions of poverty, as a result of increased health expenditure, reduced income and lost employment. The social causation theory may more readily apply to depression, and while this study is cross sectional and thus cannot make claims regarding causality, there is evidence in the qualitative research of the role of socio-economic factors in facilitating coping following an unplanned pregnancy, and in the quantitative data, of the role and protective effect of a regular income and of partner practical support, and the supportive role of a family network. These are discussed in further detail below.

An important review (Saraceno, Levav, & Kohn, 2005) has illustrated the robust body of evidence from epidemiological research on the relationship between socio-economic status, schizophrenia and depression and its important public health significance. It is clear that women in this research were at particular social disadvantage as a result of either poverty or depression or both. When considered in a vulnerability-stress-resilience framework (Ingram & Luxton, 2005), one hypothesis could be that economic stressors may have been associated with the onset and the severity or chronic nature of depression, but it is also possible that the depression itself may have resulted in social disengagement and reduced access or engagement with financial resources and supports.

These aspects are of important consideration in the conceptualisation of interventions for depression, which may need to include both psychological and social interventions.

5.4.2 Partner practical support

Access to a regular income variable was closely related with other social support variables that measured socio-economic security more indirectly, most notably receiving practical social support from partners. Acknowledgment of paternity and financial responsibility are intertwined in Zulu culture and traditional paternity claims require a man to either marry the child's mother or pay 'damages' to her family (Hosegood et al., 2009). It has been argued that the existence of the second option has encouraged men to avoid the higher costs and obligations of marriage whilst claiming their children (ss, 2006). Qualitative data showed that the acknowledgement of paternity by the partner was important to women in two ways. Firstly, because in this cultural context paternal acknowledgement brought legitimacy to the child and secured not only partner but paternal family support; secondly, acknowledgment of paternity by a father indicated an acceptance of his financial responsibility for the child.

Women whose partners had accepted responsibility and were able to offer financial support described themselves in the qualitative interviews as substantially less distressed by the pregnancy than women who had little or no partner support. Among women whose partners had acknowledged paternity, but who were unemployed or unable to offer financial support, qualitative interviews showed highly salient socio-economic stressors evident in women's stories. The possibility of paternal family support was a source of resilience among women.

An important further finding related to partnerships is that many women in the qualitative interviews reported unsupportive partnerships, with high levels of partner conflict and low levels of trust. Marital discord and having an unsupportive partner or difficulties in intimate relationships along with partner conflict, while not measured quantitatively in this research, have been shown to have a significant relationship with depression both during pregnancy and the postnatal period (O'Hara & Swain, 1996; Ramchandani et al., 2009; Stewart et al., 2003).

Qualitative interviews showed that partner support was important to a sense of well-being in relation to the pregnancy and whether the pregnancy was wanted or unwanted. Research in Europe suggests it is important to pay attention to the relational context important in which adjustment to both pregnancy and HIV take place (Pereira & Canavarro, 2009). Unplanned and unwanted pregnancies have been shown to be associated with depression in the literature (Lancaster, 2010; O'Hara & Swain, 1996; Robertson et al., 2004). In this study, while unplanned pregnancies were not shown to be associated with depression, qualitative data indicates that whether the pregnancy was wanted or unwanted was more closely linked to psychological distress. Having an unwanted pregnancy was closely related to partnership status and the reaction of the partner to the pregnancy, regardless of whether it was planned or unplanned.

5.4.3 Family living, belonging and social support

Interestingly, the qualitative findings show that in most instances where partner support was not present, the presence of family support from a woman's family of origin could compensate. Many women reported wanting their pregnancy despite the absence of partner support in situations where clear social support was being offered for the pregnancy by the family of origin. This links closely with the factor most strongly associated with depression from the quantitative data, which was that living in a family homestead was significantly protective.

In Zulu communities women will not leave their family of origin until the *ilobolo* or marriage process is complete. Within the Zulu cultural framework, living in one's family homestead would imply a collective responsibility, which is accepted for members of that homestead by the head of the household and other household members (Hosegood et al., 2009).

Marriage rates in the sample were low (8%) and comparable with low marriage rates (less than 20%) among women aged 18 to 29 years in the Demographic Surveillance Area (DSA)

reported by Hosegood et al. (2009), and slightly lower than the South African national average (16%) for women under the age of 25 years (Statistics South Africa, 2009). Specific Zulu cultural traditions, which govern and determine how intimate relationships become formalised and legitimised, are commonplace in the study community. In the absence of marriage, women tend to remain in a partnership but will live in their family home until the process of *ilobolo* or marriage is complete. Given their unmarried status, most women (79.8%) in the sample also reported living in a family (kin-headed or parental) homestead, which is common in KwaZulu-Natal.

Living independently of family is not a common cultural norm or a highly valued aspiration in this population. Given that partnerships in this community most likely do not involve cohabitation, there is a degree to which a sense of belonging and companionship will be provided within the family network rather than through non-formalised partnership relationships. Cutrona (1984) found that the absence of companionship and a sense of belonging to a group of similar others during pregnancy was associated with depression, more so than a lack of intimacy with the husband. Family living in Zulu communities thus implies access to a source of regular and structured social support, companionship and a sense of belonging. Access to regular and structured social support, either through the direct or indirect benefits of living in a familial home or through regular income and practical support from partners has important mental health benefits.

Aside from leaving the family homestead after marriage or for work migration, social or family conflict is a common reason for leaving the safety and security of the family network in traditional Zulu communities. Some anthropological evidence has suggested that in some traditional families, young women bearing a child out of wedlock can be highly stigmatising and may decrease women's social value and role, and cause significant family conflict and may result in a loss of social support from the family of origin (Mfono, 2009; Preston-Whyte, 1993). The qualitative interviews suggest that for the women most at risk of depression this was frequently the case. Unplanned pregnancies frequently increased family and social conflict, and the lack of family support led women to feel isolated and overwhelmed by the pregnancy. Unlike the case of family support, which is able to compensate for a lack of partner support, supportive partnerships do not reduce distress for women who have lost family support, or have a high level

of family of social conflict. Similar findings have been shown in traditional cultures in Asia (Lau, Yin, & Wang, 2010).

This social conflict and social isolation may be an important variable in relation to depression since perceived social isolation in pregnancy is a strong risk factor for depression in the postpartum period (Lancaster et al., 2010; Robertson et al., 2004). Closely linked to both social and psychological risk factors, interpersonal risk factors have been found to be more influential than socio-demographic factors in and of themselves. Lack of social support and social conflict are known to be significant predictors of depressive symptoms. Social or interpersonal conflict is considered the stronger predictor of the two, with the 'dose' or level of interpersonal risk being linked to the severity of depressive symptomology (WestDahl et al., 2007).

5.4.4 The role of HIV testing during pregnancy

A further hypothesis for the elevated risk in this sample may be the influence of high HIV prevalence and the contingent risks it introduces to pregnant and postnatal women.

Research among postnatal women in areas of high HIV prevalence in sub-Saharan Africa has found higher prevalence than reported for Western and Central Africa (Chibanda et al., 2010b; Stewart et al., 2009)

Similarly, in research (Freeman, Nkomo, Kafaar, & Kelly, 2008) with HIV infected non-pregnant adult populations in South Africa found an overall prevalence of 43.7% for mental disorders among people living with HIV. Hence, high levels of HIV prevalence in sub-Saharan Africa may account for at least some of the elevated prevalence in the antenatal and postnatal period.

Research among women with HIV has shown that they are four times more likely than HIV negative women to be depressed (Morrison et al., 2002). Estimates of depression among HIV positive women have varied in the literature, with prevalence rates between 1-35% being reported in clinical settings (McDaniel, Fowlie, Summerville, Farber, & Cohen-Cole, 1995), and from 30-60% in community samples (Ickovics et al., 2001).

The findings of this study show that HIV status was not significantly associated with depression although slightly more HIV positive women were depressed than HIV negative women, and there is an indication that with larger samples one may have seen an effect. Qualitative interviews, however, illustrate testing for HIV is stressful and difficult for all women, and places HIV positive women, particularly those with already precarious family or partner support, in a vulnerable position. This dose effect described by WestDahl et al., (2007) in social or partnership conflict is an important consideration given the qualitative evidence that HIV testing often introduces or escalates existing partnerships conflict.

However, qualitative data suggests that HIV is important predominantly as a secondary variable in terms of how it may impact on more primarily important variables during pregnancy, such as partnerships and familial support. Among HIV negative depressed women, a crisis in partnerships and social support related to the pregnancy caused equivalent levels of distress to HIV.

While HIV testing as part of PMTCT is critical for HIV prevention, it is also a stressful life event for all women, and a particularly negative life event for women who test positive. Significant research exists to suggest that testing for HIV is a negative life event and that depression is not an uncommon sequelae to having learnt one's HIV positive status, particularly among pregnant and postnatal women (Stevens & Tighe Doerr, 1997). Likewise, Olley and colleagues (2004) found that female gender and increased negative life events predicted the onset of major depression in recently diagnosed HIV patients, while Moosa, Jeenah and Voster (2005) found a high co-morbidity of depression in patients living with HIV.

Stressful and negative life events are one of the most robust risk factors of depression in research to date (Lancaster et al., 2010; Robertson et al., 2004). Research has shown that both general and HIV-related life events predicted depression and perceived stress, and that HIV-related events are not necessarily more potent, suggesting that the issues of HIV and other negative life events, such as partner conflict or infidelity subsequent to pregnancy, may be intertwined (Roberts, Ciesla, Drenfeld, & Hewitt, 2001). This may add to existing vulnerabilities and stresses during pregnancy and result in or worsen depression. The possible mental health impact of HIV testing, and the issues which HIV testing introduces for all pregnant women, need to be acknowledged.

Given the timing of depression in this sample, depressed women who were also HIV positive most likely become depressed prior to testing for HIV. As such, depression itself may also influence the engagement and experience of HIV testing. This was evident in the high levels of disengagement with HIV messaging noted in the qualitative data among HIV positive depressed women, which was also evident among HIV negative depressed women. The timing of the engagement of women in antenatal care (late in the pregnancy) also limits access to the option of termination and may result in greater sense of hopelessness among depressed women. Strikingly, in the qualitative data almost all women expressed significant concern for the well-being of the baby, and interest in preventing infection. This would suggest that even among depressed women there is significant opportunity to harness these desires and direct them towards effective PMTCT. However, the narratives also clearly suggest that greater sensitivity is required in our understanding of how learning one's HIV status during pregnancy may affect a mother's conception of herself as mother versus infected and infector, and her sense of self-worth, autonomy and capacity as an HIV-positive mother figure. Much of the current focus of PMTCT is medically orientated and little attention is given to the emotional or developmental perspective from which mothers view their pregnancies and their children's future.

This study is not able to unravel the exact nature of the relationship between HIV and depression, but the findings do indicate that in most instances depression in this sample preceded HIV testing, and as such, depression may mediate the experience of HIV testing and may result in high levels of disengagement as a response to testing HIV positive. Depression appears to play a role in how women perceive and respond to HIV testing and prevention activities. EPDS data may indicate that HIV testing increases emotional distress.

Given high levels of depression, the known and expected stability of depression from third trimester to 6 weeks postnatal and the timing of the infants HIV PCR testing at 6 weeks postnatal (Lazarus, Struthers, & Violari, 2009), this qualitative data also suggests that the period of infant HIV testing may also represent significant risk for women, as illustrated in similar work in South Africa.

5.5 The EPDS as a screening tool for antenatal depression

The development of a research measurement tool which can quickly and easily identify depressed women during pregnancy or the postnatal period has obvious public health benefits, particularly in limited resource settings. Dennis (2003), in a comprehensive review of screening measures used for antenatal screening, concluded that while the EPDS is by far the most widely used instrument, diversity and inconsistency in assessment procedures have hampered the meaningful comparison of studies and compromised the development of a cumulative body of knowledge.

Further research is required to determine if indeed the EPDS is the most appropriate screening instrument, as new measures are being developed based on qualitative investigations. Austin and Lumely (2003) showed in a systematic review of 16 studies that while there are strong motivations for seeking a single screening tool for use in routine care, no screening tool (neither the EPDS or any other) has been shown to be effective as a standalone measure, making the use of screening tools in antenatal care questionable. Furthermore, a cost effectiveness study (Paulden, Palmer, Hewitt, & Gilbody, 2009) suggests that the use of screening tools may not be as cost effective as initially expected, given that low specificity results in a significant additional cost in treating or managing women incorrectly diagnosed with depression. This is particularly the case in highly resourced settings where lower cut off points are frequently utilised.

5.5.1 The overall performance of the EPDS

The findings suggest that the EPDS performed adequately as a screening tool; however, its performance was not sufficient to warrant the use of EPDS as a standalone measure of depression. This finding is consistent with concerns in the literature that normal somatic symptoms may inflate scores on the EPDS, or that mild but functionally significant depression may not be detected by the EPDS (Affonso, et al., 2000; Campbell & Cohn, 1991).

Halbreich and Karkun (2006) have shown that the EPDS is the most widely validated tool for screening for depression in postnatal samples, and that validation studies have shown a wide range of cut off points, with most falling between nine and thirteen. While culture-to-culture cut

offs for the EPDS may be necessary and evident, they may also result in some inconsistencies in prevalence rates from country to country.

These psychometric limitations are not unique to the EPDS, and methodological explanations justify only some of the discrepancies found between the EPDS translation and validation investigation (Dennis, 2003). Significant differences in the proportion of high EPDS scores across different cultural contexts were noted in an international multi-site study, suggesting that cultural factors merit more attention (Gorman et al., 2004). Bennett et al. (2004) argue that the performance of the EPDS against structured interviews is superior to that of the BDI. In some contexts in Africa, the EPDS has been critiqued for its lack of a somatic component (Hanlon et al., 2008). However, given the lack of evidence for a somatic model of antenatal depression in pregnant women in this sample it is unlikely that this accounts for any of the performance variation on the EPDS.

The results of this study show that one subscale of the EPDS, the three item anxiety subscale, performed particularly badly and may have reduced the overall performance of the EPDS. Research has consistently found a strong relationship between depression and anxiety, in particular during pregnancy and the postnatal period (Robertson et al., 2004), but the relationship between anxiety and depression in Africa and South Africa is poorly understood.

Two studies which examined anxiety prevalence in pregnancy in Africa have found disparate results: 5.8% (Esimai et al., 2008) as compared to 39% (Adewuya et al., 2006), however, the second study with a higher rate used more rigorous methodology with a clinical interview to measure anxiety. Esimai et al. (2008) did examine both anxiety and depression and demonstrated that anxiety was more prevalent in the first trimester of pregnancy as compared to depression, which was more prevalent in the third trimester of pregnancy. It is not clear why the anxiety items on the EPDS performed poorly in this sample, although it may suggest that in this sample depression was of a more chronic nature with less anxious features.

5.5.2 The clinical usefulness of the EPDS

While most of the critique directed at the EPDS in the literature is based on concern over its use as a tool to estimate prevalence in larger population samples, O'Hara and Swain, (1996) and Cox et al. (1993) argue that the EPDS has particular use as a clinical tool since a variety of

cut off points have been shown to illustrate levels of depression from mild to severe. This is useful in resource-limited clinical settings where referral opportunities are limited.

In this study, while EPDS prevalence estimates and all comparisons of the EPDS against the gold standard used the international clinical standard of ≥ 13 , when other cut off points were considered the sensitivity and specificity performance of the EPDS differed slightly at various points. An important finding of this research was that the EPDS performed slightly better on specificity than on sensitivity, and given Paulden and colleagues' (2009) cost effectiveness findings, which show that the biggest cost burden is a result of treating non-depressed women for depression, this may indicate that the EPDS is useful in resource-limited settings, since stricter cut offs allow for adequate screening out of all true negatives.

The results would indicate that different cut offs may be useful in different resource settings in South Africa. A cut off of ≥ 10 may be suitable in well-resourced settings if all women with mild risk can be feasibly treated; a cut off of ≥ 14 may be suitable in resource-limited settings if all women without risk of depression should be excluded in order for all women with moderate risk to be feasibly treated; a cut off of ≥ 17 may be warranted in scarcely resourced settings where only severe clinical depression can be feasibly treated. This makes the EPDS a valuable tool in clinical settings in South Africa, in particular given its ease of use among health care practitioners and its acceptability among women (Zelkowitz & Milet, 1995).

Literature has consistently found that prevalence rates on the EPDS tend to be higher than those on structured interviews (O'Hara & Swain, 1996). Prevalence estimates based on EPDS in this study were in fact slightly lower (44%) than the prevalence reported using the structured interview method, although not significantly so. This is likely linked to the finding that the EPDS performed slightly better on specificity than it did on sensitivity, and since the EPDS measured the number of symptoms rather than severity or duration it may suggest that true positives in this sample reported marginally fewer symptoms but of greater clinical severity, which would increase their likelihood of diagnosis on the SCID as compared to the EPDS.

In addition, depression as measured on the SCID did not show a significant association with HIV, whereas depression as measured by the EPDS, using a standardised cut off of ≥ 13 , did have a significant association with HIV status. This would suggest that while there is not a

significant association between depression and HIV status in this sample, the EPDS may have been particularly effective or sensitive at identifying emotional distress post HIV testing. It is likely that the association between high EPDS scores and HIV positive status is explained by HIV positive women reporting a higher number of emotional distress symptoms (which would result in their positive score on the EPDS), but did not necessarily show the severity and duration criteria to warrant a diagnosis of depression. This finding may suggest that the EPDS is an effective follow-up screening tool which can be utilised as part of ongoing care to identify HIV diagnosis-related distress.

5.5.3 The performance of subscales of the EPDS

The analysis of the performance of subscales and items of the EPDS produced an important result. Firstly, the analysis of the two sub-scales on the EPDS showed that the seven item depression scale performed better than the overall ten item version and the three item anxiety subscale. This is congruent with a suggestion that depression in this sample did not have particularly anxious features. Secondly, a shorter three item version of the EPDS, which included three items from the depression subscale, showed improved performance on the seven and ten item EPDS. In light of this a short three item EPDS version, referred to as the EPDS-Zulu, would be the most effective method for screening for antenatal depression. These findings are strengthened by the fact the three items included are congruent with the three highest eigenvalues on the principal component analysis, suggesting that these items measure the most salient aspects of depression and that they do so effectively.

5.6 Summary of findings

The rates of antenatal depression in this sample are four times higher than in developed contexts and twice as high as evidenced in Africa, which is cause for concern. These rates are similar to those evidenced in other low and middle income countries and among high risk populations in high income countries, and to adult populations in sub-Saharan Africa. Similar to global research, vulnerability is high in the latter part of the pregnancy and likely develops along a continuum.

Most cases of depression in this study were severe and included disturbance of mood, loss of interest and suicide ideation. Most cases were chronic with episode duration of at least two months, and are likely associated with loss of functional status. There is no evidence to support depression being a culturally-bound phenomenon, and no significant somatisation of depression was noted. Somatic symptoms common to pregnancy did not dominate the diagnostic picture. Rates of suicide ideation were high and warrant attention.

Socio-economic and social support variables are closely associated with depression in this study. Regular income, partner support and supportive family relationships are protective against depression and are interrelated. Qualitative research suggests that testing HIV positive, having an unwanted pregnancy, and partnership or social conflict are significantly distressing to women, and may influence their vulnerability. Depression appears to play a role in how women perceive and respond to HIV testing and prevention activities.

The EPDS screening tool has reasonable sensitivity and specificity in this population, but is slightly better at screening out women who are not depressed than identifying women who are depressed. A shorter three item version of the EPDS is as effective at identifying depression as a longer seven item depressive subscale, and the full ten item version. The anxiety scale performed very poorly in this population and may have decreased the overall performance of the EPDS, and the relationship between depression and anxiety in this population remains poorly understood. Unexpectedly, the prevalence of depression on the EPDS was lower than that found on structured interviews. The EPDS was significantly associated with HIV status suggesting that it may be a useful tool for identifying HIV testing distress.

5.7 Study limitations

The lack of statistical power in this study may have resulted in an over-reporting of depression. However, the confidence intervals indicate that this is likely a reasonable estimation of the prevalence of depression and the study benefited from the use of a gold standard. It is likely, therefore, that despite sample size limitations, the estimates of antenatal depression are a reasonable indicator of high prevalence of antenatal depression in South Africa.

Given that women enrolled later in their pregnancy, this research is limited in that it is not able to report on issues related to the first and second trimester of pregnancy; this sample may also be over representative of women who present late in pregnancy for antenatal care. Given existing evidence in the literature, the high rates of depression among this group of women may have resulted in their late presentation.

Caution must be raised regarding the level of training and support offered to interviewers as part of the research, since it is likely that this may have resulted in strong clinical probing skills which in turn could have resulted in the higher level of symptom reporting and specificity. However, this level of training and the time allowed for the interview would probably not be replicable at a primary health care level in limited resources settings. Since there is a lower level of skill among primary health care staff and significant resource constraints in such settings, it is questionable whether this level of reporting would occur spontaneously in the absence of a clinical interview.

A higher number of HIV positive women (n=26) were lost to follow-up as compared to HIV negative women (n=18) between enrolment and assessment. It is possible that since women did not know their HIV status at the time of making the decision to enrol, but did learn their HIV status shortly thereafter, that learning that one was HIV positive may have influenced women's willingness or capacity to continue participation in the research study. No further details of the specific women who did not return are known.

This study provides no evidence for the need to develop a culturally-specific diagnostic assessment to determine depression among pregnant women in a predominantly rural, black Zulu population. While the Zulu ethnic population is the largest ethnic group in South Africa, the

results of this study may not necessarily be generalisable to other adult populations outside of pregnancy, or to cultures such as the Venda and Xhosa cultures which may be distinct from Zulu culture in South Africa.

While the clinical profile of depression based on the principal component analysis is useful for pregnant women, the difference in eigenvalues was small and subtle and this finding may not generalise to postnatal or other non-pregnant women. While many women had severe depression, the degree of functional impact among these women is unknown.

The cross sectional design does not allow this study to unravel the complex interrelationship which appears to exist between HIV and depression.

Qualitative data suggests that variables such as partner or social conflict may be important to the experience and development of depression among women. The socio-economic, partner and family support variables may have emerged as strongly associated simply due to an absence of other factors, or because these variables may be proxy variables.

The effectiveness of a three item Zulu version of the EPDS may be limited in its generalizability in three ways:

- Firstly, the shorter version may not generalise to other population groups in South Africa because it may be that Zulu-specific cultural variables resulted in a particular cultural experience of depression (without anxious features).
- Secondly, it may not generalise to other types of depression, for example postnatal or general depression, in particular since other evidence (Kammerer et al., 2009) suggests that symptom sensitivity may differ between the antenatal and postnatal periods.
- Lastly, it is possible that this three item version works particularly well for chronic presentation of depression, as was evidenced in this population, and may be less applicable in the context of acute depression.

While the generalizability of the findings is limited, the sample characteristics suggest that this sample is representative of women living in high HIV prevalence areas. The basic social demographic characteristics of this sample of women, including their age range, their educational and socioeconomic status, their marital partnership and living arrangements are similar to those

of women in the same age categories living in the DSA of the Africa Centre and those living in similar peri-urban and rural areas both provincially in KwaZulu-Natal and nationally in South Africa.

Chapter 6

Conclusion

6.1 How does this research contribute to new knowledge in this field?

The findings of this study have significant public health relevance and improve our understanding of depression during pregnancy in South Africa. This research provides new knowledge in three specific areas: the prevalence and features of depression during pregnancy; the familial, social, clinical and economic risk factors for antenatal depression; and the effectiveness of screening tools to detect depression in primary health care settings.

6.1.1 Knowledge about the prevalence, features and severity of antenatal depression

In low and middle income country research, rates of both adult and postnatal depression have been shown to be consistently higher than in the developed world (Wachs, et al., 2009). In Southern and South Africa, rates of postnatal depression are two to three times higher than generally reported rates in Europe (Chibanda, et al., 2010b; Cooper, et al., 2009; Madu & Roos, 2006).

Evidence from low and middle income countries indicates that depressed mood during pregnancy and the postnatal period is associated with inadequate antenatal care, low birth weight and preterm delivery, thus increasing risks of poor maternal and child health outcomes (Rahman & Creed, 2007). Antenatal depression is the strongest predictor of postnatal depression, while other moderate predictors include anxiety and stressful life events in pregnancy, low levels of social support and a previous history of depression (Robertson, et al., 2004). Low socioeconomic status, poverty and being a single mother (all commonplace in developing country contexts) are also associated with increased depression during the antenatal and postnatal period (Patel, Simon, Chowdhary, Kaaya, & Araya, 2009; Rahman, Patel, et al., 2008).

Research in South Africa had consistently found high rates (17-37%) of depression among adults in clinic and community populations (Carey, et al., 2003) and among postnatal women (Cooper, et al., 2009), and particularly among those living with HIV (Freeman, et al., 2008), or following an HIV diagnosis (Olley, et al., 2004). Prior to this study, there was little information and data available on the prevalence of depression among South African pregnant women testing for HIV during pregnancy. Concern has been raised given the likelihood of high levels of stressors (including HIV, poverty, intimate partner violence and low social support) common in high risk contexts such as South Africa - at a time of established vulnerability (Chibanda et al., 2010b). Pregnant women in this study were found to have among the highest rates of antenatal depression in both Africa and the world. Since antenatal depression has a known and quite severe negative impact on both maternal and child outcomes, these findings provide support for significant increases in the investment of public health resources to address antenatal depression in primary health care.

Given the high HIV prevalence, the rural setting, and significant socio-economic challenges faced in the research community, it is plausible that in other less challenged communities in South Africa, prevalence may not be as high as evidenced in this study. However, even by conservative estimates, it is likely that at least a third of women are affected by depression during pregnancy. Evidence from this research points to a continuum of risk from the antenatal to the postnatal period, suggesting that screening in primary health care antenatal visits is critical to prevention efforts.

An important contribution of this research is that it illustrates that DSM-IV-TR criteria can effectively be used to detect and diagnose depression in this cultural context and in primary health care settings. As shown by other Southern African and Asian research (Bernazzani et al., 2004; Halbreich, et al., 2007; Hanlon, et al., 2008; Kaaya, Mbwambo, Fawzi, et al., 2010; Patel, et al., 2001), there is no evidence to support the development of separate culturally sensitive measures to detect depression, which allows significant cost savings.

This research showed that most cases of depression were severe, featuring depressed mood, loss of interest and suicide ideation, and were also chronic, with episode duration of at least 2 months. This has implications for intervention design as cases of severe depression in this sample would warrant individual or group psychotherapy interventions and would not likely

respond to generalised social support interventions alone. As growing body of literature (Patel & Kirkwood, 2008; Rahman, Malik, et al., 2008) has begun to illustrate, lay-counsellor and community health care worker interventions for pregnant and postnatally depressed women in developing countries are both feasible and effective. Given that women's experience of depression is similar to other low and middle income countries, it is likely that lessons learnt in those countries around the prevention, detection and treatment of antenatal and postnatal depression can be adapted for use in this context.

Adding a lay health counsellor focused on prevention or treatment of a common mental disorder such as depression during pregnancy and the postnatal period has shown particular efficacy in public health settings in low and middle income settings where, due to limited resources, models of health care favour a collective clinic-centred care model, as compared to client-centred models, frequently seen in well resourced private settings (Patel, et al., 2009). The severity and chronic nature of depression found in this research sample also raises questions regarding the possible role, and the relative risk and benefits of pharmacological interventions during pregnancy and the postnatal period (American Psychiatric Association and the American College of Obstetricians and Gynecologists, 2009; Kuehn, 2010). Future research is required to explore in more detail the exact impact of severe depression on functionality, in particular, in relation to health functionality, since preliminary evidence from this research suggest that depression results in both social and health disengagement, which may have significant health-related implications during pregnancy and the first year postnatal.

6.1.2 Knowledge about familial, social, clinical and economic risk factors

This research provides evidence to support the hypothesis that increased stressors (such as partner conflict, lack of practical support and regular income, low family support, family and social conflict over unplanned pregnancies, HIV testing) at point of known vulnerability (pregnancy) likely increases not only the prevalence but also the severity of depression.

This evidence can be applied in intervention designs which aim to reduce stressors, and also to introduce protective factors to increase resilience during and in response to pregnancy. Furthermore, since any major depressive episode increases vulnerability and the likelihood of the future reoccurrence of depression, high rates of depression among the antenatal population

implies there will be a matching increased risk of depression among postnatal women and mothers in general. Thus, health care providers need to be sensitised to the risk of depression throughout the life course.

This research shows that socio-economic stressors, such as a lack of access to a regular income or never having practical support from a partner, were significantly associated with depression, as was living away from, or without family support. Partnership and family conflict, unwanted pregnancies and testing HIV positive also place women at elevated risk of mental health difficulties and emotional distress. Furthermore, the findings illustrate that among women who become depressed, onset is mostly likely during the second trimester, indicating that screening needs to occur early and should be repeated regularly during pregnancy, in particular as the pregnancy advances. The research suggests that HIV positive women are not significantly more likely to be depressed than HIV negative women and thus screening, prevention and treatment efforts should not target HIV-infected women specifically.

This research found almost half the women to be depressed, and a large amount of women presented late in pregnancy for care. It is plausible, given these research findings, that depression may reduce health care engagement. While individual or group therapy interventions may be most cost effectively placed within the primary health care setting, the presence of depression itself may hinder compliance with, and attendance at, centrally placed clinic-based services. When possible, therapeutic interventions should be supported by home-based care and follow-up. This will help ensure improved health care access and compliance, and to reduce the effect of functional disability on both mother and child. Furthermore, if individual and group interventions occur in isolation of the partnership and family stressors shown to play a critical role in this research, and which likely contributed or precipitated the depression in the first instance, intervention impact may be reduced, and women may be placed at risk for future depression. Given the findings of this research, a broader set of psycho-social interventions may be needed over and above psychological interventions for severe depression.

This broader set of interventions might include, based on the risks identified in this study, improved family planning interventions which strengthen women's autonomy to make reproductive health choices in rural settings; relationship interventions which improve women's communication and independence within their partnerships and families, and to encourage

partnership support for the pregnancy and the child; and cognitive interventions which focus on health engagement, problem-solving and management of interpersonal and social conflict. Universal access to health care and family strengthening activities are in line with the *Joint Learning Initiative on Children and AIDS (JLICA)* findings on strengthening families in the context of HIV and AIDS (Richter et al., 2009).

Qualitative data from this research provides important information to strengthen and guide routine antenatal care and HIV screening and care services during pregnancy. PMTCT programmes need to consider two important issues within this special population of HIV testers. Firstly, this research shows that all women, regardless of whether they test positive or negative, find HIV testing stressful; and women who test negative but who have difficulties with infidelity in their partnerships or have concerns about the window period may be equally at risk of mental health difficulties as women who are HIV positive. Secondly, within a vulnerability-stress framework of depression, HIV is an innate vulnerability, but must also be viewed as a possible tipping point stressor which may illicit strong emotional responses, reducing resilience and worsening the severity of an existing depression.

In line with emerging evidence (Betancourt, Abrams, McBain, & Fawzi, 2010; Sandelowski & Barroso, 2003) the results of this study illustrate that PMTCT programmes need to be sensitised to mental health issues. Depressed pregnant woman in this study were less likely or able to engage with HIV prevention activities and information, and may require added support and guidance. Since information about treatment brings optimism and hope to HIV positive women, and since hope is critical to recovery from depression, information during pregnancy should not only focus on PMTCT, but should also provide information on maternal health, positive living and future options in terms of maternal HIV treatment and care.

6.1.3 Knowledge about the effectiveness of screening to detect depression

While, as this research illustrates, there is high prevalence of depression, depression during pregnancy and the postpartum frequently remains undetected and untreated (Luskin, et al., 2007). Increased contact with health care providers during pregnancy and the postpartum may provide unique opportunities for screening, prevention and early treatment. However, in

poorly resourced settings, early detection and prevention of depression during pregnancy and the postpartum is limited by critical shortages in health care professionals. Evidence suggests that task shifting of primary care and prevention functions to Community Healthcare Workers (CHW) improves the health outcomes of populations at a reasonable cost (McPake & Mensah, 2008). While lay professionals can successfully prevent and treat common mental disorders such as depression in public health settings in low and middle income settings (Rahman, Malik, et al., 2008), without routine and efficient screening tools, such interventions could not be replicated at scale.

The Edinburgh Postnatal Depression Scale (EPDS10) is the most widely used screening tool for the detection of depression during pregnancy and the postpartum. Prior to this study, no research to date has examined the effectiveness of brief versions of the EPDS in South Africa. Thus, an important contribution of this research is that it shows that in settings where resources are scarce, the EPDS-3R could assist with screening to identify women in need of further assessment and treatment during pregnancy and possibly in the postpartum period. While the EPDS10 remains a valuable tool for screening by health care professionals in settings where more time and resources are available, these results suggest that the EPDS-3R is a highly effective brief and user-friendly measure available for use by community health care workers and lay health counsellors to optimize screening and referral for treatment of depression during pregnancy or the postpartum period at both a community and a primary health care level. Effective screening, however, does not automatically amount to effective treatment access or improved outcomes (Miller, et al., 2009; Mitchell & Coyne, 2007). Further research is required to establish and adapt appropriate CHW level interventions (Patel, et al., 2009) and to evaluate treatment and referral algorithms such as those recently published (World Health Organization, 2010).

This research offers three important contributions in terms of the future direction of antenatal screening for depression. Firstly, it illustrates that a brief three item screening tool adapted from the EPDS which covers mood, loss of interest and suicide, successfully detects most cases of depression. The EPDS-3R resembles closely the PHQ-2 primary health care screen, recommended for universal screening by the Preventative Task Force in the United States and the National Institute of Health and Clinical Excellence in the United Kingdom (Mitchell &

Coyne, 2007). While the PHQ-2 has been shown to be effective in antenatal samples in the United States, it is less sensitive than the EPDS among pregnant compared to non-pregnant samples (Smith, Gotman, Lin, & Yonkers, 2010).

Secondly, suicide risk was particularly high and most suicidal women were also diagnosed with depression. It is noteworthy that the analysis of depression symptoms showed that suicidal ideation had the highest eigenvalue, and analysis of individual items on the EPDS showed that item 10 “*the thought of harming myself has occurred to me*” was significantly correlated to depression in univariate and multivariate analysis. Importantly, the PHQ-2 excludes a self-harm item. Including a self-harm item to ultra brief screens in antenatally and postnatally could improve the identification of women at risk for depression. The EPDS-3R may also have relevance for universal screening in perinatal care in other contexts, such as the United States, given recent calls by the National Institute for Mental Health (NIMH) for increased use of paraprofessionals in screening and referral during home visiting programmes, and in busy primary health care contexts.

Finally, qualitative data would suggest that consideration of two further items enquiring about the status of the partnership and access to family support will likely detect all cases of clinical depression needing referral and treatment.

6.2 What conclusions can be drawn from this research?

In conclusion, this research illustrates that depression is significant problem in pregnancy, that established methods are effective to detect depression, and that the impact of depression is likely high. This research points to specific partner, family and socio-economic risks which likely increase risk for depression and warrant intervention attention. It also highlights the complexity of interactions between HIV and depression, in particular in relation health functionality and engagement with HIV and other prevention services. Finally, the brevity and sensitivity of this novel 3-item EPDS could facilitate screening for antenatal and postpartum depression by health professionals, lay health counsellors and community health care workers.

6.3 What recommendations can be made for intervention and research?

The research found very high rates of depression, highlighting the urgent need for investments to improve the detection, prevention and treatment of antenatal depression in primary health care and community settings.

6.3.1 The strengths of this research

- It provides a reasonable estimation of the high prevalence of depression in the antenatal period which can guide policy, practice and public health investments.
- The gold standard assessment of antenatal depression provides useful clinical information on the features of depression and guides the diagnosis and treatment of antenatal depression.
- The methodological approach and rigour ensures a culturally sensitive assessment of depression and illustrates the diagnostic validity of DSM-IV-TR criteria in these settings.
- The use of both screening and gold standard assessments allows for a short effective screening tool, which can be feasibly implemented in primary health care contexts in resource limited settings, to be identified.
- The research identified risks for mental health outcomes in participating women, including poverty, partnership conflict and lack of practical support, and lack of social support from families.

6.3.2 The limitations of this research

- The sample size was pragmatic, thus, the statistical power is limited and the findings may not be generalisable to other populations.
- The cross sectional design did not allow for the complex relationship between HIV and depression to be fully unpacked or for the predictors of depression to be established.
- The research does not provide a functional assessment of severe depression.
- Women were enrolled late in the pregnancy and several factors associated with depression at earlier stages in the pregnancy are not covered by this research.

6.3.3 Recommendations for further research

1. Studies with larger and more diverse samples which include both antenatal and postnatal women in areas of high HIV prevalence are needed in order to establish with greater precision the prevalence of depression during pregnancy and in the early postnatal period.
2. Longitudinal research is required to understand the course of depression over the pregnancy and into the postnatal period, to better understand the risk and protective factors for depression and the nature of the relationship between HIV testing and mental health during pregnancy.
3. Further research is required to better understand functional loss and degree of disability among severely depressed women and how it may inform interventions for antenatal depression and health-related prevention during pregnancy, in particular in the context of HIV.
4. Further research is required to test the generalizability of this shorter version in other populations and across a variety of clinical settings and types of depression.
5. Further research is needed to understand the relationship between anxiety and depression and the complex interrelationship which appears to exist between HIV and depression.

6.4 Conclusion

This research, one of only a few studies in Africa, illustrates the high risk of antenatal depression during pregnancy and informs the literature on risk and protective factors for antenatal depression. The finding that a 3-item screen adequately detects depression in poorly resourced settings, has significant public health applicability, and will significantly improve the ability to detect and treatment antenatal depression. The research design is distinctive in that it allowed for a comprehensive assessment of depression with the triangulation of both quantitative and qualitative data collection methods.

Both the quantitative and qualitative findings point to the importance of psycho-social support, love, acceptance and belonging during pregnancy. Factors significantly associated with depression such as the increased risks introduced by having little practical support from partners, or no regular source of income and the critical protective role of a family network to help facilitate the economic, social and emotional transition into pregnancy are also poignantly illustrated and supported in women narratives about their pregnancy and their lives.

The qualitative findings lead to improved understanding of the complex relationships between pregnancy, depression, and HIV testing and health functionality. They provide useful information regarding the complex social-cultural familial context in which pregnancy occurs and how closely pregnancy legitimacy links to risk of depression. Narratives also offer insight in to how depression may influence engagement with HIV prevention and how treatment optimism can assist in alleviating emotional distress. This study will inform and improve our understanding of antenatal depression and provide evidence for appropriate psychological, social and public health interventions targeted at women during pregnancy.

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Appendices

Appendix A Socio-Demographic Questionnaire

Identifier Code: *Correlates to the PMTCT code, random batches at clinic*

Date of Birth: *Date/month/year*

1.) Details of the current pregnancy

Stage of Pregnancy:

Second Trimester (>3<6) ☐ Third Trimester (>6<9) ☐

Number of antenatal clinics visits thus far:

First ☐ Second ☐ Third ☐ Fourth and above ☐

Expected due date: _____

Expected delivery place: _____

Expected Immunization Clinic: _____

Pregnancy was: Planned ☐ Unplanned ☐

2.) Details of her marital status

Single		Not currently in a formalized relationship at all, not living together, could still be in a relationship but it's not formal so officially
Cohabiting		In a relationship and living with partner but not in any traditional or formal marriage.
Married		In a formal relationships either by common law or traditional marriage.
Separated		Previously in a formal relationship, but currently separated and in the process of marriage dissolution.
Divorced		Previously in a formal relationships and has formally terminated it.
Widower		Previously in a formal relationship and spouse has died.

3.) Details of her relationship status

Regardless of marital status, is she currently in a relationship with the father of this child?

Yes ☐ No ☐

Does the father of this child currently live with her?

Yes ☐ No ☐

(In the following section ask about her biological children only)

Does she have other children by this father/man:

Yes ☐ No ☐ If Yes: Number of children by him ☐

Does she have other children with other fathers/men:

Yes ☐ No ☐ If Yes: Number of other children ☐

4.) Child Care Responsibilities

What is the total number of children she takes care of at home:

(Include all biological and non biological children whom she takes care of on a regular basis)

Child 1 ☐ Age: _____

Relationship: _____

Child 2 ☐ Age: _____

Relationship: _____

Child 3 ☐ Age: _____

Relationship: _____

Child 4 ☐ Age: _____

Relationship: _____

Child 5 ☐ Age: _____

Relationship: _____

Child 6 ☐ Age: _____

Relationship: _____

Is there anybody else at home who helps with taking care of the children: (*focus on practical daily care- not financial care*)

No Help ☐ Partner ☐ Mother ☐ Father ☐

Grandmother ☐ In Laws ☐ Sibling ☐ Other ☐ _____
Not Applicable ☐

5.) HIV Status

Have you previously tested for HIV Yes ☐ No ☐

If Yes, did you take your result Yes ☐ No ☐

If Yes, How long ago was the last test:

Under 3 months ☐ > 3 months ☐ >6 months ☐ >9 months ☐

More than 1 year ☐ More than 2 years ☐ More than 3 years ☐

6.) Education and Occupation

Does she have any education?

No Education ☐

Schooling ☐ If yes - list highest grade attained: _____ *You must list the highest grade passed*

Post School ☐ If yes - describe briefly: _____ *Previous categories too tedious leave open rather*

Are you currently employed: Yes ☐ No ☐

If yes, Specify: _____

7.) Income

Is there any formal (fixed or regular) income coming into your homestead which is not grant related: Yes ☐ No ☐

If Yes, list source (x) and estimated amount or other details:

Partner ☐ _____

Mother ☐ _____

Father ☐ _____

- Grandparent ☐ _____
- In Laws ☐ _____
- Sibling ☐ _____
- Other ☐ _____
- Not Applicable ☐ _____

8.) Grant support

Does she receive any direct or indirect support from a grant: Yes ☐ No ☐

If yes, specify type, number and beneficiary

- Social Relief ☐ _____
- Disability ☐ _____
- Pension ☐ _____
- Child support ☐ _____
- Foster Care ☐ _____
- Care Dependency ☐ _____

8.) Housing

Living circumstances and type of housing she lives in and whether it is linked to a family homestead (either her own or partners):

- A shared house within family homestead ☐ Family homestead shared
- Her own separate house but at family homestead ☐ Family homestead independent
- A shared house within non family homestead ☐ Non family homestead shared
- Her own separate and family independent house ☐ Non family homestead independent

Household access to resources:

Access to a source of running water:

- In the house ☐ Outside the house ☐

If Outside the house, specify:

Less than 5 min walk ☐

Between 5 and 15 min walk ☐

More than 15 min but less than 40 min walk ☐

More than 40 min walk

Access to electricity: Yes ☐ No ☐ *Main source of fuel:*

Wood ☐ Paraffin ☐ Coal ☐ Electricity ☐ Gas ☐ Other ☐

Appendix B Social Support Questionnaire

Instructions: Listed below are various people who may be important in your life. For each person please circle a number from 1 to 3 to show how well he or she provides the type of help that is listed. **Please Note:** If there is no such person in your life, please leave that section blank and go to the next section.

Section 1 – Your husband or partner		Never	Sometimes	Always
1.)	Can you share your feelings openly with your husband/partner?	1	2	3
2.)	Does he give you practical help?	1	2	3

Section 2 – Your mother		Never	Sometimes	Always
1.)	Can you share your feelings openly with your mother?	1	2	3
2.)	Does she give you practical help?	1	2	3

Section 3 – Your father		Never	Sometimes	Always
1.)	Can you share your feelings openly with your father?	1	2	3
2.)	Does he give you practical help?	1	2	3

Section 4 – Your best friend		Never	Sometimes	Always
<i>(Include if closest friend is brother or sister)</i>				
1.)	Can you share your feelings openly with your best friend?	1	2	3
2.)	Does s/he give you practical help?	1	2	3

Section 5 – Any other significant person		Never	Sometimes	Always
<i>(Please specify, E.g. Counsellors, Health care worker, Social worker, Faith based worker, Community leader)</i>				
.....				
1.)	Can you share your feelings openly with this person?	1	2	3
2.)	Does s/he give you practical help?	1	2	3

Appendix C Edinburgh Postnatal Depression Scale

These questions are about how you have been feeling IN THE PAST TWO WEEKS, not just how you feel today. Each statement about the way you feel has four different choices. Please tick the answer that comes closest to the way you have been feeling over the past week.

1. I have been able to laugh and see the funny side of things

- ☐ As much as I always could
- ☐ Not quite so much now
- ☐ Definitely not so much now
- ☐ Not at all

2. I have looked forward with enjoyment to things

- ☐ As much as I ever did
- ☐ Rather less than I used to
- ☐ Definitely less than I used to
- ☐ Hardly at all

3. I have blamed myself unnecessarily when things went wrong

- ☐ Yes, most of the time
- ☐ Yes, some of the time
- ☐ Not very often
- ☐ No, never

4. I have been anxious or worried for no good reason

- ☐ No, not at all
- ☐ Hardly ever
- ☐ Yes, sometimes
- ☐ Yes, very often

5. I have felt scared or panicky for no very good reason

- ☐ Yes, quite a lot
- ☐ Yes, sometimes
- ☐ No, not much
- ☐ No, not at all

6. Things have been getting on top of me

- ☐ Yes, most of the time I haven't been able to cope at all
- ☐ Yes, sometimes I haven't been coping as well as usual
- ☐ No, most of the time I have coped quite well
- ☐ No, I have been coping as well as ever

7. I have been so unhappy that I have had difficulty sleeping

- ☐ Yes, most of the time
- ☐ Yes, sometimes
- ☐ Not very often
- ☐ No, not at all

8. I have felt sad or miserable

- ☐ Yes, most of the time
- ☐ Yes, quite often
- ☐ Not very often
- ☐ No, not at all

9. I have been so unhappy that I have been crying

- ☐ Yes, most of the time
- ☐ Yes, quite often
- ☐ Only occasionally
- ☐ No, never

10. The thought of harming myself has occurred to me

- ☐ Yes, quite often
- ☐ Sometimes
- ☐ Hardly ever
- ☐ Never

Appendix D Structured Clinical Interview for Depression (MDE Section)

SCID: Depressed Mood:

- 1.) Since your pregnancy, has there been a period of time when you were feeling depressed or down most of the day, nearly every day?
- 2.) If yes, when did you first start feeling like this?
- 3.) Do you still feel like this?
- 4.) If improved, when did you start feeling better?
- 5.) What is it/has it been like for you?

SCID: Loss of Interest or Anhedonia:

- 1.) Have you lost interest or pleasure in the things you usually enjoyed?
- 2.) Has this been nearly every day?
- 3.) How long have you been feeling like this?
- 4.) What is it/has it been like for you?

SCID: Weight Disturbance or Appetite changes:

- 1.) Has your appetite been affected?
- 2.) If yes, in what way?
- 3.) Did you lose or gain any weight?
- 4.) What is it/has it been like for you?

SCID: Sleep Disturbance:

- 1.) Have you been so unhappy that you have been having difficulty sleeping?
- 2.) How often has this happened?
- 3.) Have you had difficulty falling asleep?
- 4.) Have you been waking often or having difficulty staying asleep?
- 5.) Do you find you are waking too early?
- 6.) Do you find you are sleeping too much?
- 7.) Does this happen every day/night?
- 8.) What is it/has it been like for you?

SCID: Agitation/ Retardation:

- 1.) Have you been so fidgety or restless that you have been unable to sit still?
- 2.) Has this been so bad that other people have noticed?
- 3.) What did they notice?
- 4.) Was it nearly every day?
- 5.) If no: What about the opposite: Have you been talking or moving more slowly than is usual for you?
- 6.) What did other people notice?
- 7.) Was this nearly every day?
- 8.) What is it/has it been like for you?

SCID: Fatigue/ Anergia:

- 1.) What has your energy been like?
- 2.) Have you been feeling tired?

- 3.) Have these feelings of lack of energy or tiredness been a problem nearly every day?
- 4.) What is it/has it been like for you?

SCID: Worthlessness/ Guilt:

- 1.) How have you been feeling about yourself?
- 2.) Have you been feeling worthless?
- 3.) How often have you been feeling like this? Has it been nearly every day?
- 4.) Have you been feeling guilty about things that you have done?
- 5.) How much of the time have you been feeling like this? Has it been nearly every day?
- 6.) What is it/has it been like for you?

SCID: Concentration impaired:

- 1.) Have you had trouble thinking or concentrating?
- 2.) What kinds of activities have been affected?
- 3.) Has this been a problem for you nearly every day?
- 4.) Has it been hard for you during this time to make decisions about everyday things?
- 5.) What is it/has it been like for you?

SCID: Suicidal Ideation:

- 1.) Have things been so bad that the thought of harming yourself occurred to you?
- 2.) How often?
- 3.) Have you been thinking that you would be better off dead?
- 4.) Have you been thinking about hurting yourself?
- 5.) Have you done anything to hurt yourself?
- 6.) If yes to any self harm questions, probe gently for details, make referral.

**IF RESPONDENT HAS SPOKEN OF DEPRESSED FEELINGS/LOSS OF INTEREST
ASK:**

- 1.) When did you first start feeling like this?
- 2.) Is it current or resolved?
- 3.) Did these feelings start before your pregnancy? If so, how long before?
- 4.) If you have had other children, did you experience these feelings during other pregnancies or after the birth of your other children?

FOR ALL RESPONDENTS EXCLUDE:

- Serious medical illness
- Recent bereavement \leq 1 year

Appendix E Qualitative Interview Guide

Introduction:

We are interested in learning about the thoughts and feelings that occupy pregnant women's minds. I would like to ask you some questions that will hopefully help us to understand more, about what you are experiencing at the moment, please feel free to talk as much as you like and to tell us your whole story.

Warm-up

How do you feel about coming here today?

Story of this pregnancy

Are you comfortable to talk with me about your pregnancy and your experience of becoming and being pregnant?

Can you tell me the story of this pregnancy, what has your pregnancy been like?

Allow narrative, reflect and probe where needed, suggested probes:

How are you feeling about your pregnancy?

Most people experience worries from time to time. Have you found yourself having worrying thoughts recently?

Do you have any worries about your baby? Can you tell me a bit about these worries?

Do you worry about coping with a new baby? Do you feel you have support?

Story of HIV testing in the pregnancy

Are you comfortable to talk with me about your status and your experience of testing for HIV?

As part of PMTCT you were asked to test for HIV, can you tell me what that was like?

How are you feeling about learning your status?

If the mother has not explicitly referred to concerns about her status in relation to herself and her expected baby in the earlier part of the interview, the interviewer should cautiously and sensitively probe about worries and thoughts using the above questions. The interviewer should also enquire whether the extent of any anxieties/worries has change since diagnosis:

Did learning your diagnosis change how you feel about yourself? How/what changed?

Has learning your diagnosis changed how you feel about your pregnancy or your baby?

Have you told other people about your diagnosis?

If yes: How have they reacted? *If no:* Why haven't you told anyone?

Ending off questions

Is there anything more that you would like to tell me before we end off?

Thank you for spending the time talking to me. It has been very helpful. I realize that we have talked about some difficult issues.

Are you feeling okay to leave now?

Appendix F Case Study Descriptions – Previous Para-suicides

Case study 1 P82-1913068

This participant is a 20 year old woman, she has completed high school and is currently unemployed and living in her maternal homestead. She is single but in a relationship with a man she describes as her partner and who has fathered this child, but whom she reports is also married to another woman. This is her first serious love relationship and she reports that this pregnancy was planned in that he had said he wanted her to have his baby. However, since becoming pregnant her partner has become erratic and has not being clear about whether or not he will support her.

The participants' family has made attempts to contact him but he has avoided having a meeting with them and will not take responsibility. She is hurt and frustrated that he is not taking responsibility because he is employed and can afford to look after the child. She has considered taking the child to his workplace after it is born and leaving it there, but her family is advising her against this. They have instead suggested that she open a legal case against him for maintenance support.

During her pregnancy she has also tested for HIV for the first time and tested HIV positive, and while she reports that she is still waiting for the results of a confirmatory test to be sure, she is worried that she is in fact positive and worries about infecting her baby. She wants to talk with her partner about this first before talking to anybody else but he is avoiding her at present, she has not disclosed her HIV status to anybody else. As a result of her relationships problems she is depressed and reports thinking often about killing herself or aborting the baby, although she realises it has become too late for that in the pregnancy.

She reports that a few weeks before she was feeling very desperate and drank some paraffin in an attempt to poison herself but it did not work it just made her sick, she then broke a glass and was planning to drink the crushed glass but her sister found her and intercepted her attempt. The family have since been watching over her closely and while she feels better she is still desperate and wonders if she would be better off dead. She reports almost all symptoms of depression save for sleep disturbance and agitation. She reports her main source of practical and emotional support as her mother and sister.

Case study 2 P19-1878603

This participant is a 28 year old woman, who has completed high school and is currently unemployed. She is in a stable relationship with her partner with whom she lives, at his paternal homestead, and with whom she has one other child aged 16 months. She has an older child aged 6 years from a previous relationship who does not live with her. She reports that this pregnancy was unplanned and that she did not want it, feeling it has come too soon since her last child, however her husband has refused to allow her to use contraception and has been unsupportive since he found out she was pregnant.

She reports that there has been conflict in the relationship for quite some time and there was an incident of domestic violence after her partner's sister accused her of stealing money from the family. It emerged later that the sister had hidden the money in an effort to cause conflict between the couple as she did not approve of the participant's relationships with her brother.

She has tested positive for HIV in this pregnancy and when she tried to discuss the HIV test with her partner she reports that he was shocked that she would agree to test, and became angry accusing her of not trusting him, at that point she was afraid to disclose her HIV positive status, and is pretending to herself that perhaps she is not positive. She worries that hiding the virus will have bad consequences for her child who may then end up positive.

She reports that after the conflict with her partner escalated two years before she had a previous episode of depression and attempted suicide by hanging herself but was unsuccessful, at the time she received support from her mother and the clinic, and while she reports that her one 'sister in law' is supportive of her, the rest of her partner's family are not. Since learning her HIV status she has attempted to drink poison (ratex) but only became very ill and went to hospital for two days. She reports feeling desperate and worried about who will care for her children; she reports almost all symptoms of depression save for agitation or retardation. Given that she was actively suicidal, and reported low levels of family support at the time for the interview this participant was admitted to hospital under the care of the psychologist for further management.

Appendix G Results of the interactional effect of social support and income

	Multivariate (LL-57.07)		Multivariate (without homestead LL-62.05)		Multivariate (without income LL-60.50)	
	AOR (95% CI)	p value	AOR (95% CI)	p value	AOR (95% CI)	p value
Regular formal income						
<i>No</i>	1.00					
<i>Yes</i>	0.30 (0.12-0.76)	0.011	0.37(0.15-0.85)	0.020		
Living arrangements						
<i>Family</i>						
<i>Non Family</i>	6.79 (1.59-28.95)	0.010			5.21(1.33-20.43)	0.018
<i>Missing</i>	0.22 (0.02-2.72)	0.01			0.17 (0.01-2.40)	0.189
Social support						
Partner - practical						
<i>No partner</i>						
<i>Never</i>	3.06(0.49-19.26)	0.234	3.87 (0.66-22.84)	0.135	4.25 (0.70-24.90)	0.110
<i>Sometimes</i>	0.75(0.16-3.39)	0.704	1.26 (0.31-5.15)	0.751	0.92 (0.21-3.94)	0.914
<i>Always</i>	0.18(0.04-0.90)	0.037	0.32 (0.73-1.41)	0.133	0.230 (0.05-1.06)	0.060
Father - practical						
<i>No partner</i>						
<i>Never</i>	1.81 (0.51-6.49)	0.361	1.80 (0.54-5.94)	0.336	1.93 (0.55-6.70)	0.299
<i>Sometimes</i>	0.82(0.22-2.97)	0.757	0.88 (0.30-2.90)	0.837	0.75 (0.21-2.66)	0.661
<i>Always</i>	0.60(0.10-3.59)	0.579	1.01 (0.19-5.30)	0.985	0.63 (0.10-3.60)	0.602

Appendix H Overall range of EPDS scores for entire sample

